The Grill: Gopal Kapur of the Center for Project Management has a new project: curing IT's addiction to junk food and overindulgence. **PAGE 17**

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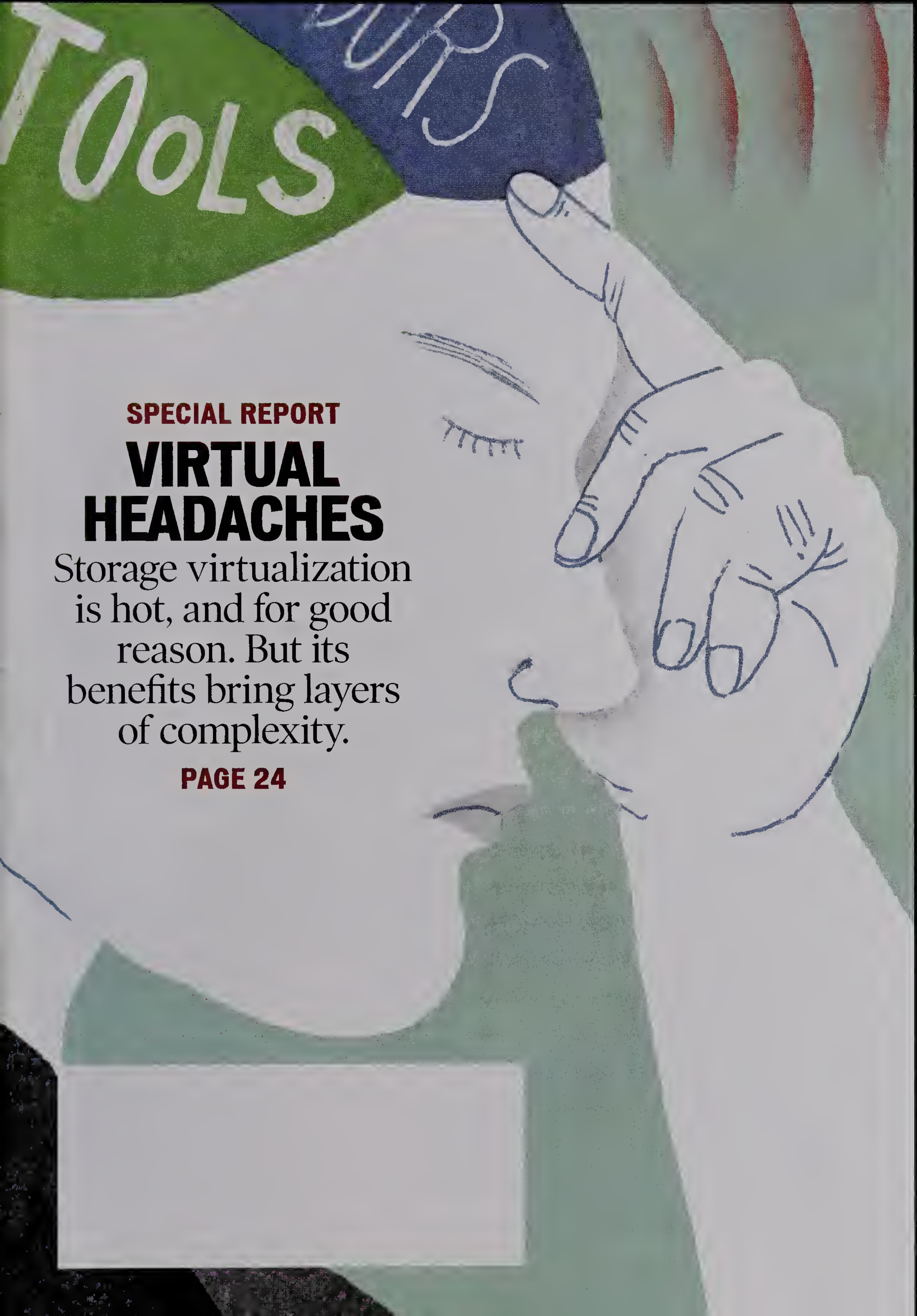

SPECIAL REPORT

VIRTUAL HEADACHES

Storage virtualization is hot, and for good reason. But its benefits bring layers of complexity.

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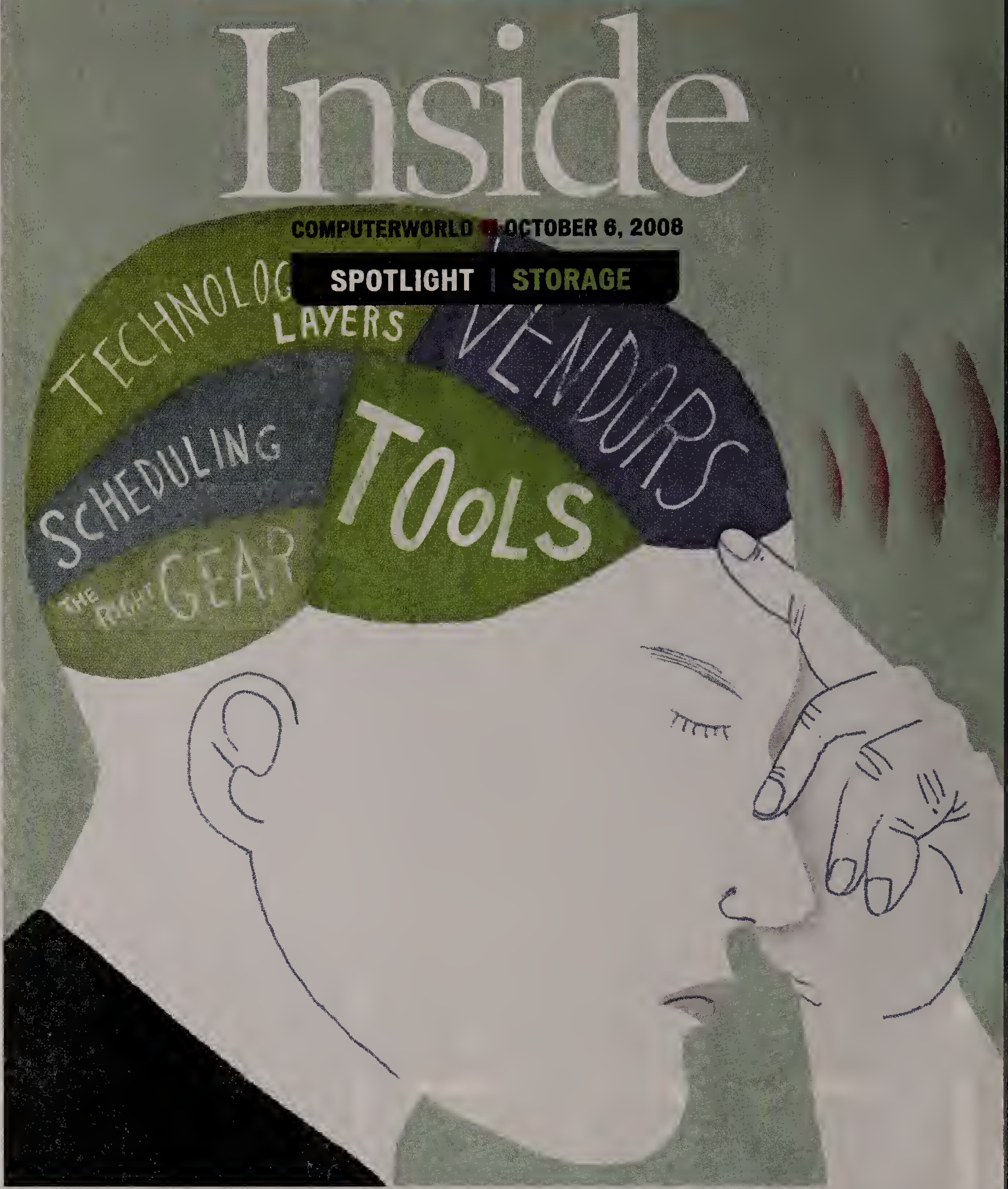

SPECIAL REPORT

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COVER ILLUSTRATION BY CHRISTOPHER SILAS NEAL

ONLINE

PRODUCT GUIDE: Learn more about storage virtualization vendors, their products and prices, and their customer lists.

OPINION: Thanks to virtualization, the days of throwing more hardware at IT infrastructure problems are coming to an end, says columnist Jerome Wendt.

SMART MFPs?
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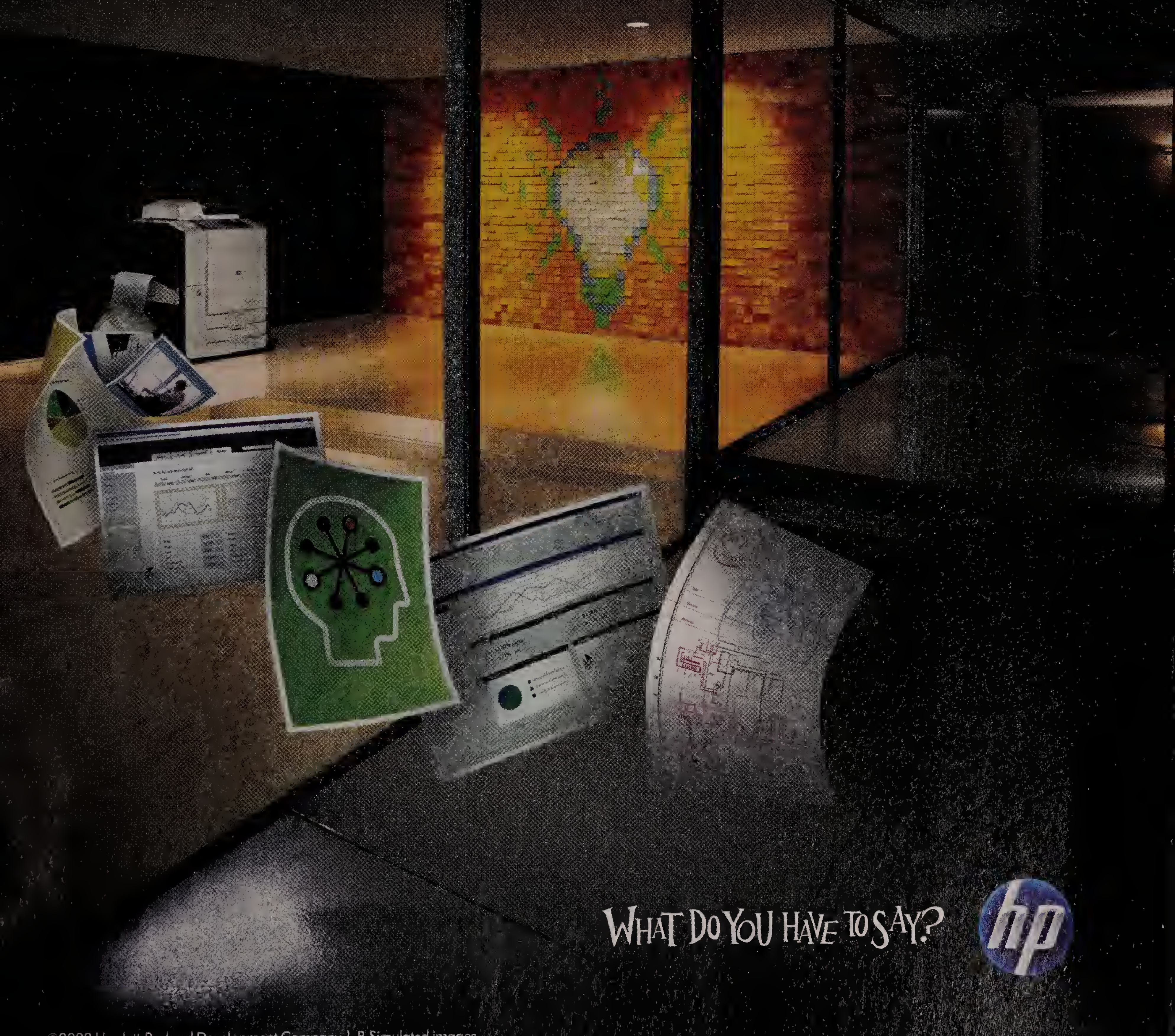

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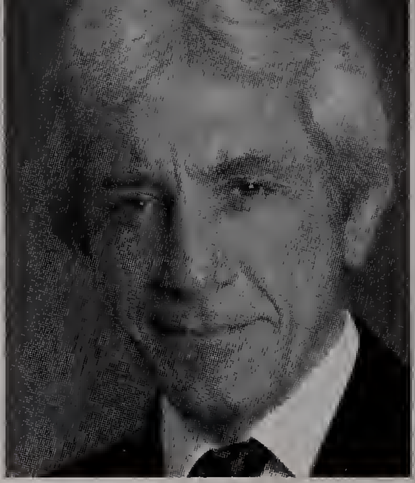
EDITOR'S NOTE

Don Tennant



Asperger's Oxymoron

NO STORY we've done in the past six months has resonated more with readers than our May 5 cover story, "IT's Open Secret." The article was about the preponderance of people with varying degrees of Asperger's syndrome in the IT profession, and it sparked an insightful, if sometimes heated, discussion on our Web site.

The story, by Tracy Mayor, won acclaim outside our readership as well. Just a couple of weeks ago, it received *Folio* magazine's gold award for best article in a B2B publication in the technology/computing/telecom category. But while such awards are gratifying, what really gets us charged is seeing a story charge up our readers.

At this writing, the online version of the article has drawn nearly 100 comments from readers, ranging from those who identify themselves as having Asperger's or some other form of autism, to colleagues and relatives of these "Aspies," to those who had never even heard of the disorder before. The central question I found myself asking after reading the dozens of comments is this: Should Asperger's be treated, or should Aspies simply be left alone to take advantage of their problem-solving traits? On balance, is the condition a help or a hindrance in life?

I wondered much the same thing last July when I interviewed Richard Stallman, founder of the free software movement. To prepare, I had read Sam Williams' 2002 biography, *Free as in Freedom: Richard Stallman's Crusade for Free Software*. In the book, Williams wrote about Stallman's social ineptitude, intensity and hardheadedness — qualities commonly found in Aspies.

"During a 2000 profile for the *Toronto Star*, Stallman described himself to an interviewer as 'borderline autistic,' a description that goes a long way toward explaining a lifelong tendency toward social and emotional isolation and the equally lifelong effort to overcome it," Williams wrote.

When I cited that excerpt from the book during the interview, Stallman said that assessment was "exaggerated."

Making the world a better place alone is an oxymoron, because no place of solitude is a better place for human beings.

"I wonder about it, but that's as far as it goes," he said. "Now, it's clear I do not have [Asperger's] — I don't have most of the characteristics of that. For instance, one of those characteristics is having trouble with rhythm. I love the most complicated, fascinating rhythms." But Stallman did acknowledge that he has "a few of the characteristics" and that he "might have what some people call a 'shadow' version of it."

Referring to John J. Ratey's 1998 book, *Shadow Syndromes: The Mild Forms of Major Mental Disorders That Sabotage Us*, Stallman noted that "for many of the identified mental illnesses, there are a lot of people who are within the range of being normal who have slight versions of them."

"Would you say that having the shadow version has been a help or a hindrance in your life?" I asked.

"Both," Stallman responded. "It's certainly been a hindrance to me in my romantic life, but other than that, I don't think it has held me back much. At the same time, it may have given me the strength and firmness and thoughtfulness to do something important with my life."

That brings us back to the first part of my central question: Does what Stallman described constitute a condition that warrants treatment? Not all Aspies think so. As one reader who made it clear that he identifies with the syndrome put it, "Why don't you just leave us alone and let us do what we do best — create the world as a better place?"

For me, the answer lies in the wistfulness of the first part of Stallman's response, about his romantic life. And it lies equally in the negative tone of many of the Aspie readers who commented on the article.

A fundamental prerequisite to doing something important with your life and making the world a better place is forming bonds and building relationships with other people. Making the world a better place alone is an oxymoron, because no place of solitude is a better place for human beings. ■

Don Tennant *is editorial director of* Computerworld *and* InfoWorld. *Contact him at don_tennant@computerworld.com, and visit his blog at* http://blogs.computerworld.com/tennant.

ISPs and Your Privacy

I think that University of Colorado law professor Paul Ohm's quote in your story about his study points out how his warnings about privacy loss on the Internet are overblown ["Do ISPs Pose a Bigger Online Privacy Threat Than Google?" Sept. 15]. Putting the specter of ISPs snooping at the public's browsing habits into perspective, Ohm said, "I'm not saying that they are invading your privacy right now. What the paper does is to play out the possibilities. ISPs have the power to obliterate privacy."

But the fact remains that ISPs have no incentive to "obliterate privacy." In fact, the incentive is just the opposite. If the public objects strongly to such practices, the ISP market will meet that demand and not snoop. It's the government solutions that Ohm desires that would present a real and lasting threat to Internet freedom.

■ **James G. Lakely,** *managing editor,* Infotech & Telecom News, *The Heartland Institute, Chicago, jlakely@heartland.org*

Infrastructure, People And the Premier 100

I always find Don Tennant's columns interesting and insightful, but never has one been more sensitive or real than "Context of Collapse" [Editor's Note, Sept. 22]. He is right — it is the people who count. They are and will continue to be strong. Thank you for enabling me to put the whole financial collapse into proper context. And thank you for the incredible honor of being selected as a Premier 100 recipient. I am still overwhelmed by the concept of it. It is the ultimate affirmation of my career.

Bart Perkins' column in the same issue talked about IT infrastructure as IT's stepchild. We are treated that way within most corporations. Infrastructure is assumed to be a utility. *Computerworld* is the one media outlet that gives infrastructure its due respect. Thank you for selecting this lifelong infrastructure professional for such an incredible honor.

■ **Mary Leonardo Patry,** *American Red Cross, Washington*

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Famous Tech Myths That Just Won't Die

OPINION: John Brandon debunks the widespread fables about Bill Gates, the iPhone kill switch, the Internet and more.

Gadgets That Will Make Your Cell Phone Jealous

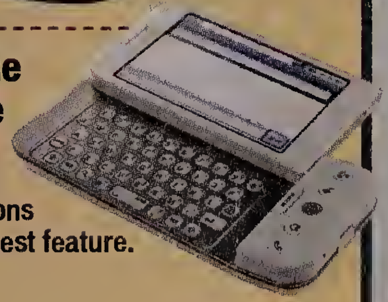
OPINION: Sunglasses, wristwatches and pens are stealing features from your phone, says Mike Elgan. How cool is that?

How That Desk Job Wears Your Body Down

The tech employee's stress-filled, sedentary lifestyle sets the stage for a host of health problems, from chronic pain to obesity, hypertension and heart disease. Here's how to make a midcourse adjustment before it's too late.

10 Great Wi-Fi Devices For Work And Play

Add these gadgets to your network for a new world of wireless productivity and entertainment.



Hands-on With the Android G1 Phone

It's solidly built with beautiful screen quality, but the onboard applications are by far this handset's best feature.

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News Digest

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THE WEEK AHEAD

MONDAY: Microsoft's Business Intelligence Conference, focusing on the vendor's own BI products, opens in Seattle.

MONDAY: AFCOM, a professional association for data center managers, kicks off its fall Data Center World conference in Orlando.

TUESDAY: IdentEvent 2008, an identity management conference run by the trade group ITAA, starts in Washington; the speakers include de facto federal CIO Karen Evans.

AP PHOTO/RICH PEDRONCELLI

SECURITY

Schwarzenegger Again Nixes Data Breach Bill

FOR THE second time in 12 months, California Gov. Arnold Schwarzenegger last week vetoed legislation that would have required retailers and other businesses operating in the state to take a series of steps to protect credit and debit card data.

The Consumer Data Protection Act, or AB 1656, would also have required retailers to disclose more details about data breaches to the people affected by them. The California State Assembly and Senate overwhelmingly approved the measure last month.

But in a veto message to state legislators, Schwarzenegger said he wouldn't sign the bill for the same reasons he rejected the original version last October. Both bills attempted "to legislate in an area where the marketplace has already assigned responsibilities and liabilities that provide for the protection of consumers," he wrote.

Banks and credit unions around the country have been lobbying for legislation like AB 1656 in the wake of the highly publicized data breaches at retailers such as The TJX Companies Inc. and Hannaford Bros. Co.

> **"This bill attempts to legislate in an area where the marketplace has already assigned responsibilities and liabilities that provide for the protection of consumers.**
>
> **GOV. ARNOLD SCHWARZENEGGER,** FROM HIS "VETO MESSAGE" TO CALIFORNIA LEGISLATORS ON AB 1656

Financial institutions contend that retailers should do more to protect cardholder data and should cover card replacement costs if their systems are breached.

The progress of AB 1656 has been watched particularly closely because of its provisions and because California has traditionally been a trendsetter on data protection issues.

Bob Arnould, senior vice president of government affairs at the California Credit Union League, said in a statement that Schwarzenegger's veto "guarantees that millions of additional Californians will have their privacy invaded."

But Gartner Inc. analyst Avivah Litan welcomed the veto. She said that instead of mandating specific security controls for retailers, state governments "should focus on protecting consumer rights through proper disclosure rules that ensure transparency in the system."

— *Jaikumar Vijayan*

DEVELOPMENT

Ballmer Says 'Windows Cloud' Is Coming Soon

MICROSOFT CORP. CEO Steve Ballmer last week revealed some details of a new operating system aimed at helping developers write Internet-based applications.

The operating system, known as Windows Cloud, will be formally unveiled within a month, Ballmer told an audience of IT managers at a Microsoft-sponsored developer conference in London.

Windows Cloud is a separate project from Windows 7, the operating system slated to succeed Windows Vista, he noted.

Ballmer, was short on details but did point out that Microsoft's hosted software, or "Software + Services," strategy does not involve moving key products like Office entirely off desktop PCs and onto the Internet.

– JEREMY KIRK,
IDG NEWS SERVICE

▼ Steve Ballmer said little about specific features of the forthcoming Windows Cloud.

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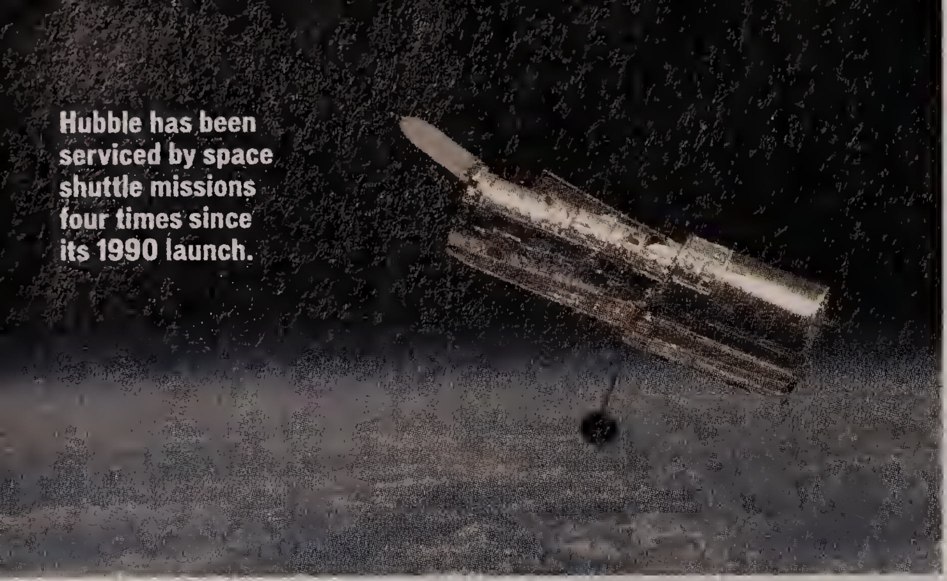

Hubble has been serviced by space shuttle missions four times since its 1990 launch.

NASA

HARDWARE

Computer Failure Hobbles NASA's Hubble Telescope

A COMPUTER FAILURE onboard the orbiting Hubble Space Telescope has forced NASA to postpone this month's space shuttle Atlantis mission, which was set to do scheduled repairs on the observatory.

John Shannon, shuttle program manager at the Johnson Space Center in Houston, said the flight will likely be rescheduled for next February or April, giving NASA time to prepare a replacement computer for delivery.

NASA scientists announced last week that a data formatter and control unit had "totally failed" on Sept. 27. The Science Data Formatter is designed to take information from five onboard instruments, format it into packets, put a header on it and send it to Earth at speeds of up to 1Mbit/sec.

Michael Moore, a program executive for the Hubble Space Telescope, said that the problematic computer has been online since the telescope was put into orbit by the space shuttle Discovery in 1990. The computer was designed by IBM in the 1970s and built by the former Fairchild Camera and Instrument Corp. in the 1980s.

Moore said the computer is a relatively simple machine but is a key part of the observatory's communications system. He added that the malfunction is the first to require that a replacement machine be delivered to the telescope.

NASA scientists are now readying onboard redundant systems to take on the communications tasks. The replacement system will be the new redundant system.

Preston Burch, Hubble manager at NASA's Goddard Space Flight Center in Greenbelt, Md., said that the exact cause of the problem won't be determined until the disabled computer is returned to Earth. "It may be thermally related," he said, noting that the "unit does run at a relatively high temperature, and high temperatures tend to accelerate any kind of degradation process."

According to Moore, remotely switching over to the redundant systems should take about 10 hours. Technicians and scientists expect to do it late next week, he added.

Ed Weiler, associate administrator of NASA's Science Mission Directorate, noted that the switch-over and subsequent installation of new redundant systems should add another five to 10 years to the telescope's life.

— *Sharon Gaudin*

Short Takes

California has became the second state to pass legislation making it illegal to steal data from RFID cards. Those found guilty of doing so face a year in jail and fines of up to $1,500.

Hewlett-Packard Co. has agreed to buy **LeftHand Networks Inc.** for $360 million. Through the transaction, HP will acquire LeftHand's storage virtualization and iSCSI products for midsize companies. The deal is expected to close in January.

Microsoft Corp. has unveiled the next version of its Visual Studio development tool suite and upgrades to its Visual Studio Team System collaborative offering. The new Visual Studio 2010 will replace the current release at an as-yet-undisclosed date.

Oracle Corp. has agreed to buy **Advanced Visual Technology Ltd.**, a maker of applications for retailers, for an undisclosed sum. Oracle plans to combine AVT's space-planning software with its Oracle Retail suite.

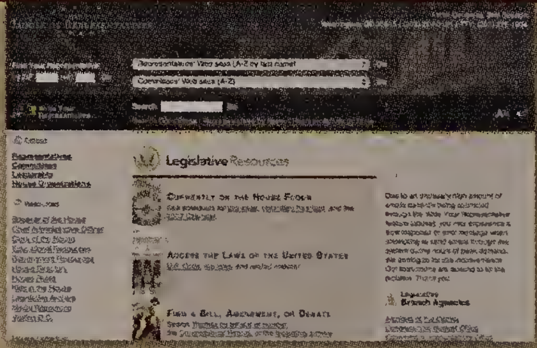
NETWORKING

House Web Site Deluged With E-mail on Bailout

THE IT STAFF at the U.S. House of Representatives took emergency steps last week in an effort to help the House's Web site handle a fourfold increase in e-mail that began after the text of the initial Wall Street bailout bill was posted online.

The crush of e-mails clogged the servers that host House.gov, leaving the site inaccessible for much of last Monday, when the House voted down the bill.

On Tuesday, the Office of the Chief Administrative Officer, which handles IT for the House, implemented a stopgap traffic-management measure to regulate the flow of e-mails from the site's embedded "Write Your Representative" application.


Representatives' Web sites (A-Z by last name)
Committees' Web sites (A-Z)
Search
Legislative Resources
Currently on the House Floor
Access the Laws of the United States
Find a Bill, Amendment, or Debate
Legislative Branch Agencies

A CAO spokesman said the e-mail app "was never meant to handle the enormous load" of messages people were trying to send. The change limited the number of users who could get into the application at once, which helped restore site access, he said. The CAO's office also was testing what, based on his description, seemed to be load-balancing technology.

For much of the week, the e-mail app and a companion "Find Your Representative" program remained sluggish or unresponsive, as did links to representatives and committees. But they appeared to be working better on Friday, when the House approved an amended bailout bill.

– JAIKUMAR VIJAYAN

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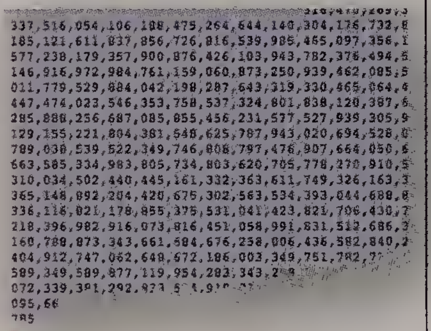
HARDWARE

Grid Leads Sysadmin to 13M-Digit Prime Number

AN IT systems administrator used a grid of computers supplied by volunteers at the University of California, Los Angeles, to find the largest known prime number.

The discovery of the 13-million-digit number earns UCLA employee Edson Smith and/or his employer half of a $100,000 prize from the Electronic Frontier Foundation. The other half of the prize goes to charity.

The discovery is part of the Great Internet Mersenne Prime Search (GIMPS), a 12-year-old project that uses computers provided by volunteers to find large prime numbers. The EFF prize is for the discovery of the first prime number with more than 10 million digits.


A sample of the number.

A prime number is a whole number that can be divided only by one and itself. Mersenne prime numbers are a class of primes named after Marin Mersenne, a 17th century French monk who studied the rare numbers.

The newly found prime number is 12,978,189 digits long. If printed out, it would run 30 miles long, Smith noted.

The calculations to find the number were done using time on 75 Windows XP-based Dell desktop PCs donated by 75 students and others on the campus. Each computer ran software that GIMPS created for the task.

Very large prime numbers "are very rare and can only be discovered through computing power," Smith said. "It's really about the power of the grid."

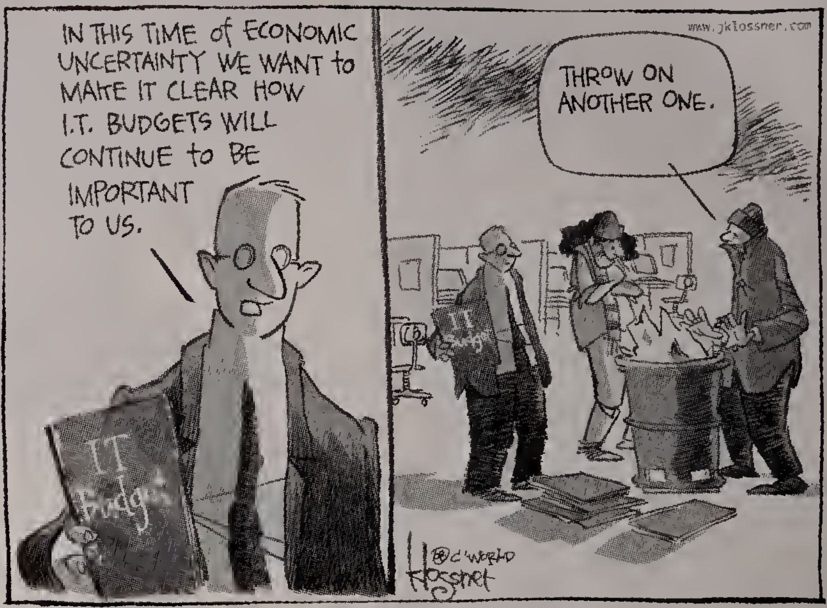
The discovery marks the eighth prime number to be discovered at UCLA. In 1952, UCLA professor Raphael Robinson discovered five Mersenne primes that are said to be the first ones found using computers.

GIMPS is now offering up to $150,000 for the discovery of the first 100-million-digit prime number.

— *Sharon Gaudin*

BETWEEN THE LINES

By John Klossner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BENCHMARKS LAST WEEK

Microsoft Corp. released a free version of its Hyper-V virtualization software, matching rival **VMware Inc.**'s move to give away its ESXi technology in July.

Amazon.com Inc. said it will add Windows Server support to its Elastic Compute Cloud online hosting service by year's end. Currently, EC2 supports only Linux.

25 YEARS AGO: As a precursor to the breakup of AT&T at the end of 1983, tape was laid on the floors of switching offices to separate the company's workers and equipment from those of its local telephone affiliates.

Global Dispatches

Funding Set for U.K. E-crime Unit

LONDON – The U.K. government last week finally committed funding to a national e-crime unit, a year after it was proposed by England's Metropolitan Police Service.

To fund the program for three years, the government will provide £3.5 million ($6.2 million U.S.) and the Metropolitan Police will contribute £3.9 million ($6.9 million), according to the U.K. Home Office.

The unit is due to begin operations next year.

Janet Williams, deputy assistant commissioner of the U.K. Association of Chief Police Officers, said the operation will include "a national coordination center to combat e-crime in England, Wales and Northern Ireland."

The funding comes almost three months after a report by the House of Lords Science and Technology Committee criticized the government for "slow" and "disappointing" progress on tackling e-crime.

Leo King,
Computerworld U.K.

Indian Outsourcers Bid for U.K. SAP Services Firm

NOIDA, India – HCL Technologies Ltd. has outbid outsourcing rival Infosys Technologies Ltd. for Axon Group PLC, an Egham, England-based provider of SAP-related services.

HCL, based here, late last month offered £441.1 million ($781 million U.S.). in cash for Axon, besting Bangalore-based Infosys' offer of £407.1 million ($721 million) in August.

The Axon board last week withdrew its support of the Infosys offer in favor of the HCL bid. Infosys said it is evaluating whether to make a counter-offer for Axon.

John Ribeiro,
IDG News Service

BRIEFLY NOTED

Nokia Corp. last week agreed to acquire Montreal-based mobile messaging company Oz Communications Inc. for an undisclosed price. At the close of the deal, expected in the fourth quarter, Oz will become part of Espoo, Finland-based Nokia's services and software unit.

Nancy Gohring,
IDG News Service

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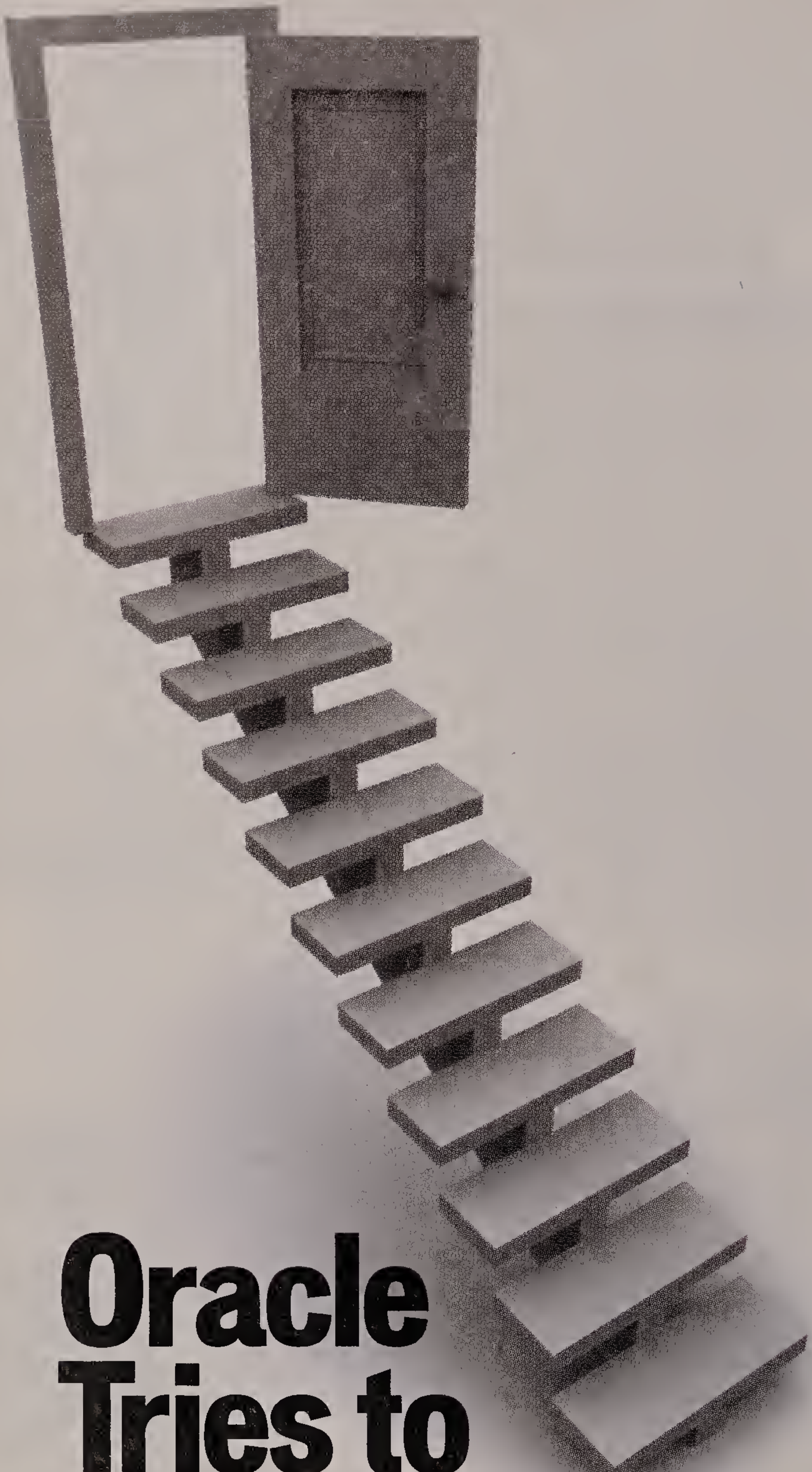

Oracle Tries to Step Up on HIGH-END DATABASES

The database market leader is pushing several new technologies in an effort to make its software more scalable. But are users ready for what it's offering? **By Eric Lai**

SINCE 2005, Oracle Corp. has spent at least $32 billion on acquisitions — turning itself into the vendor of a top-to-bottom enterprise software stack that is arguably broader in scope than any rival suite.

In doing so, Oracle hasn't diluted its database focus. Sales of databases and middleware still account for more than half of its revenue. And according to Gartner Inc., Oracle controlled 49% of the global database market last year, with more revenue than the next four vendors — IBM, Microsoft, Teradata and Sybase — combined.

But Oracle has shown some signs of vulnerability at the high end of the database market. For instance, many Web 2.0 companies are eschewing its databases and instead running open-source technologies such as MySQL on grids of PC servers. And corporate users with data warehouses sized in the hundreds of terabytes, or even in the petabyte range, are finding column-oriented databases and specially tuned data warehousing appliances to be more scalable than Oracle databases are.

So Oracle's annual OpenWorld conference in San Francisco two weeks ago was heavy on database news, as the company tried to show that it is agile enough — and its software is robust enough — to respond to the new challengers.

At the top of the list was Oracle's announcement of a pair of hardware products — its first ever — aimed at users looking to get ultrafast performance out of their ultralarge databases.

For the past six months, Oracle CEO Larry Ellison had teased users and analysts with hints that the vendor would introduce a "database accelerator" at OpenWorld. That turned out to be the Exadata Storage Server, which combines Oracle's parallel query software with ProLiant servers from development partner Hewlett-Packard Co.

What makes the Exadata system different from a typical storage server, according to Oracle, is the database intelligence built into the device. Ellison claimed that Exadata can speed up large queries by performing lower-level calculations on the information it stores and then sending the results to the main database, instead of flooding it with raw data.

The other new product, the industrial-sounding HP Oracle Database Machine, is a self-contained system designed to match up against integrated data warehousing appliances from vendors such as Teradata and Netezza Inc.

The Database Machine combines eight regular database servers running Oracle Database 11g with 14 Exadata systems that have a total storage capacity of 168TB and InfiniBand connections offering 14GB/sec. of aggregate data bandwidth.

That all costs a mere $2.33 million — for existing customers that have enterprise or unlimited Oracle database licenses. New customers would have to pony up for licenses for the eight database servers; based on the configuration recommended in an Oracle white paper, that would cost an additional $3.22 million, analysts said.

Even so, Christo Kutrovsky, a database administrator at The Pythian Group

Continued on page 14

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Continued from page 12

Inc., an Ottawa-based company that manages databases for corporate clients, said he thinks the Database Machine could be worth the steep cost if the alternative is having the IT department try to assemble a similar system itself.

"Ninety percent of the problems I've seen are due to improperly configured systems," Kutrovsky wrote in Pythian's corporate blog. Installing the Database Machine eliminates that issue by making configuration errors "impossible," he said.

According to Oracle, customers that tested production workloads on a half-size Database Machine said queries ran 10 to 72 times faster than they did on other systems. Those early users include the Chicago Mercantile Exchange, supermarket chain Giant Eagle and LGR Telecommunications, which develops data warehousing systems for telecommunications carriers.

In a blog post, Forrester Research Inc. analyst James Kobielus described the introduction of the Database Machine and Exadata as "a bold move into petabyte scale-out territory — an emerging, very-high-end niche in which one veteran vendor, Teradata, has been preeminent."

Kobielus also noted that Oracle's storage layer is transparent to applications, meaning they don't need to be rewritten in order for users to see performance gains on the new systems.

LUKEWARM RECEPTION

But Tim Hall, a U.K.-based Oracle DBA, blogged that he was "a little underwhelmed" by the OpenWorld announcement. "It all seems a little irrelevant to me," Hall wrote, citing the price tags and high-end focus of the new products. "For me, this is like discussing the merits of a Lamborghini when I'm actually going to buy a Renault Clio."

And independent database analyst Curt Monash said that although the Database Machine and Exadata are impressive from a technical standpoint, he doesn't expect them to win over many Web 2.0 companies or other new users. The technologies make the most sense for businesses that already use Oracle's data warehousing products and "are content to pay Oracle prices," Monash said.

For companies that don't have money to spend on a turbocharged system like the Database Machine, Oracle is touting 11g's Advanced Compression option. In a session at OpenWorld, Oracle officials said the data compression technology can dramatically shrink database table sizes and boost read/write speeds by as much as three to four times in data warehouses as well as transaction databases.

In fact, Oracle claims that companies using Advanced Compression no longer need to move seldom- or never-used older data to archives. Instead, they can keep all that information in their production databases, according to Oracle officials.

But users haven't flocked to Advanced Compression yet. One reason is that it's not a free add-on: Licenses start at $11,500 per processor — a relatively high price in its own right.

In addition, the technology is available only to users of the year-old 11g Enterprise Edition, which has yet to be widely adopted. Andrew Mendelsohn, senior vice president of server technologies at Oracle, said that 75% of the company's database customers are running its 10g release, while another 20% are still using the even older 9i version.

For instance, LGR Telecommunications has built a pair of 300TB data warehouses for AT&T Inc., which stores its caller data records in them. But the databases, which run concurrently, are based on 10g and can't take advantage of Advanced Compression yet.

Hannes van Rooven, a technology manager at LGR, said during a presentation at OpenWorld that his company uses compression only to a limited extent now, although it does plan to increase its usage "extensively" in the future.

Intermap Technologies Inc. is running the spatial version of 11g for an 11TB database of mapping and imagery data that is expected to grow to 40TB by the first quarter of 2010. But Sue Merrigan, senior director of information management at Intermap, said that the company doesn't compress the data "because we're concerned it would lose its accuracy."

That wouldn't happen, Oracle officials said. But comments such as Merrigan's show that even among some of its loyal customers, the vendor still has a sales job to do on Advanced Compression — never mind the Database Machine and Exadata. ■

Chris Kanaracus *of the IDG News Service contributed to this story.*

Mum's the Word on 11g Upgrade Plans

ORACLE FILLED the OpenWorld conference schedule with sessions hyping the various features in its 11g database, which was launched in July 2007. But it didn't disclose any details about an upcoming second release of the database.

Charles Phillips, one of Oracle's two presidents, said during an earnings conference call last month that the company would deliver an 11g upgrade in its current fiscal quarter, which ends in November. And Oracle did do some recruiting of beta testers for 11g Release 2 at OpenWorld.

But it doesn't have any imminent plans for R2-related announcements, said Andrew Mendelsohn, Oracle's senior vice president of server technologies. Mendelsohn, who oversees database development at Oracle, declined to provide shipment dates for either R2 or the 11g Express Edition, a free version that will be aimed at developers.

Oracle hasn't divulged the number of users that have adopted 11g, saying only that the database has been downloaded more than 450,000 times and that installations are "on pace" with the initial uptake of its earlier 10g software.

Officials from the Independent Oracle Users Group were scheduled to be briefed on the 11g R2 beta program at OpenWorld under a nondisclosure agreement, according to Ian Abramson, a Toronto-based data warehousing consultant and president of the database-oriented IOUG.

"I think we'll understand their timelines a lot better [after the briefing]," Abramson said, adding that the IOUG already has volunteers who are ready to take part in the beta program.

– CHRIS KANARACUS, IDG NEWS SERVICE

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Wall Street's Collapse Puts IT Spending in (Some) Peril

The turmoil in the financial markets isn't expected to lead to a tech-spending recession. But budgets may be in for some paring. **By Patrick Thibodeau**

© ISTOCKPHOTO / JAMES STEIDL

THE OVERALL economic cost of Wall Street's collapse has yet to be totaled. But it's clear that IT departments will be laboring under some changed conditions in the months ahead.

Despite the turmoil in the financial markets, consulting firms Gartner Inc. and Forrester Research Inc. are both still forecasting that IT spending will fare better than the economy as a whole and continue to grow on a year-to-year basis.

The tech industry may be "even more resilient than we had originally imagined," Gartner analysts Ken McGee and Mark McDonald wrote in a report sent to the firm's clients last week. But they also said that they expect IT growth rates to be "very low" until the business climate improves.

That could happen by the second half of next year, the analysts said. They advised IT managers to hedge a little and prepare two budgets for next year: one based on the directions they get from corporate executives, and an alternative "growth budget."

Forrester analyst Andrew Bartels has actually raised his growth forecast for IT purchases this year to 5.4%, up from a May prediction of 3.4%. But in a report issued Sept. 24, Bartels said that he expects to see a slowdown in tech buying for the remainder of the year and into the first half of 2009. Bartels, who once predicted a 10% increase in IT spending next year, now believes the growth level will be just above 6%.

Charles King, an analyst at Pund-IT Inc. in Hayward, Calif., said many IT managers are likely to delay both new projects and upgrades to products such as Windows Server 2008. "Unless a business can prove that it's absolutely critical to have those products to improve earnings or save a significant amount of money, I would expect companies to put off purchases as far as they possibly can," he said.

The CIO Executive Board, an Arlington, Va.-based association for IT execs, said last week that more than half of the 50 CIOs it surveyed on Sept. 25 are putting nonessential projects on hold and that nearly 25% have frozen IT hiring. In addition, a majority said that they are re-evaluating their budget plans for next year.

Tight credit could be an even more immediate problem for IT managers who are looking to buy or lease new equipment or are embarking on major projects.

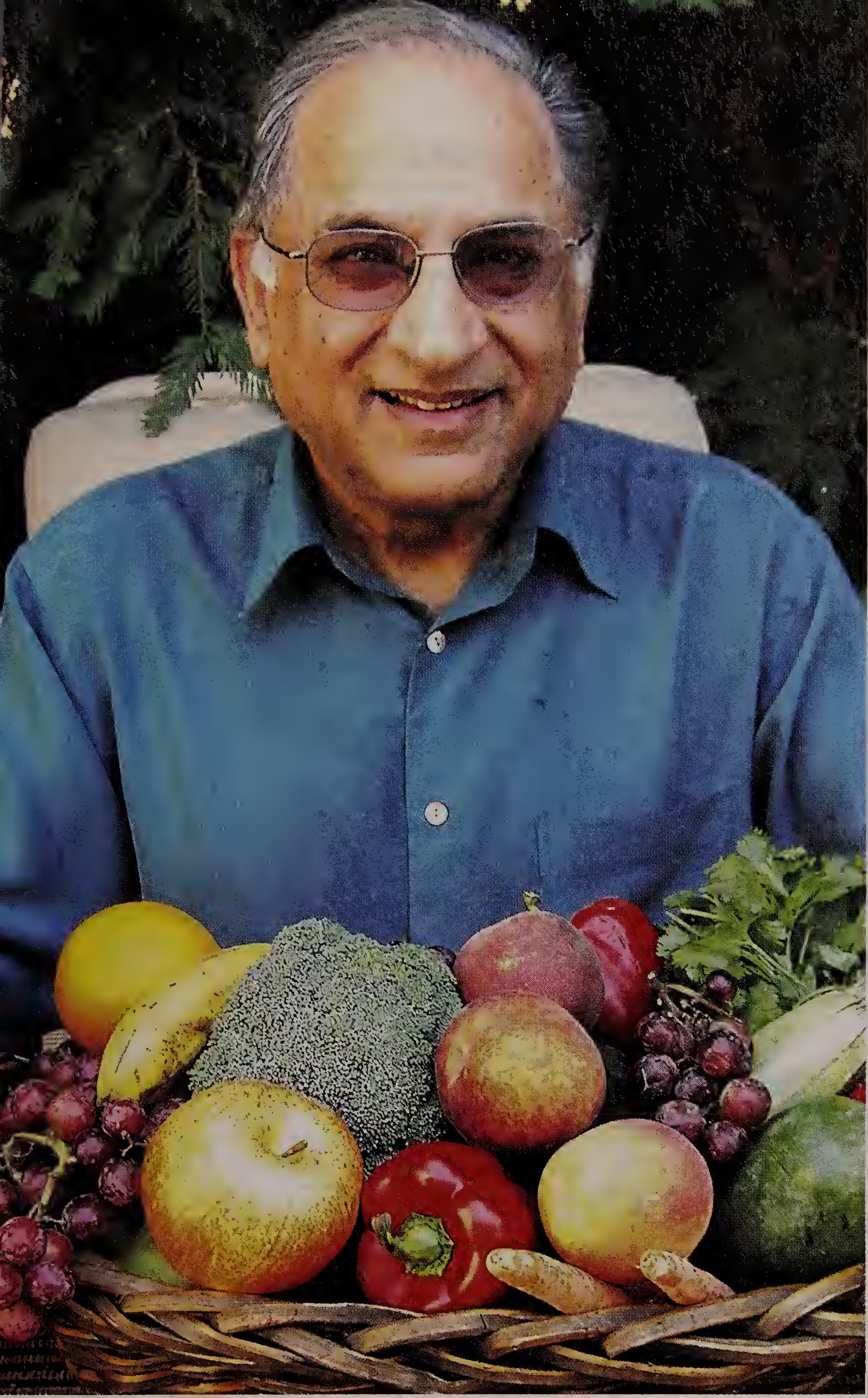
The credit problem, resulting from banks being unwilling to add more loans to their current debt loads, is "the biggest threat from a buyer's standpoint," said Brian Babineau, an analyst at Enterprise Strategy Group in Milford, Mass. "A lot of IT purchases are financed."

Budget-cutting may drive some companies to engage in more offshore outsourcing. But the presidential election is a potential wild card. Eugene Kublanov, CEO of outsourcing consultancy NeoIT Inc. in San Ramon, Calif., said the next president could propose tax incentives to encourage job growth in the U.S. — especially if Democratic candidate Barack Obama is elected.

The IT job market is likely to see an influx of newly available talent, partly because of payroll cutbacks in the financial services industry as newly merged banks consolidate their systems and data centers. And a longer-term outcome of Wall Street's implosion may be increased enrollments in computer science programs at U.S. universities, as IT becomes a more attractive career option for students who might have pursued banking and finance paths before.

One thing that won't change, though, is the advice IT managers are getting on how they can reduce costs by consolidating servers and installing virtualization technology.

Ken Brill, executive director of The Uptime Institute Inc. in Santa Fe, N.M., said that as many as 15% of the servers in any data center are "comatose." Eliminating those systems can save lots of money — as can focusing on energy savings when buying new servers, according to Brill. And the time may be even riper for such steps now. "Maybe in this downturn," he said, "efficiency will become more important." ■



PHOTOS BY DARLENE KAPUR

■ THE GRILL

Gopal Kapur

The **project management** expert talks about **sugar surge protectors, junk-food walls** and his biggest project: **turning IT green** from the inside out.

Dossier

NAME: Gopal Kapur

TITLE: President

ORGANIZATION: Center for Project Management

LOCATION: San Ramon, Calif.

FAVORITE TECHNOLOGY: "Very sharp, well-balanced knives."

ROLE MODEL: "My father. During the Indian independence struggle, he was an underground fighter against the British."

FANTASY DINNER PARTY: "Alexander the Great, the first foreigner to visit India; Michelangelo, the best project manager I know of; Harriet Tubman – she had vision, passion, a plan that she executed, she managed risks, and she was successful; Thomas Jefferson, a project manager I would like to talk with about change; and my wife, Darlene."

SOMETHING PEOPLE DON'T KNOW ABOUT HIM: "I have no sense of direction."

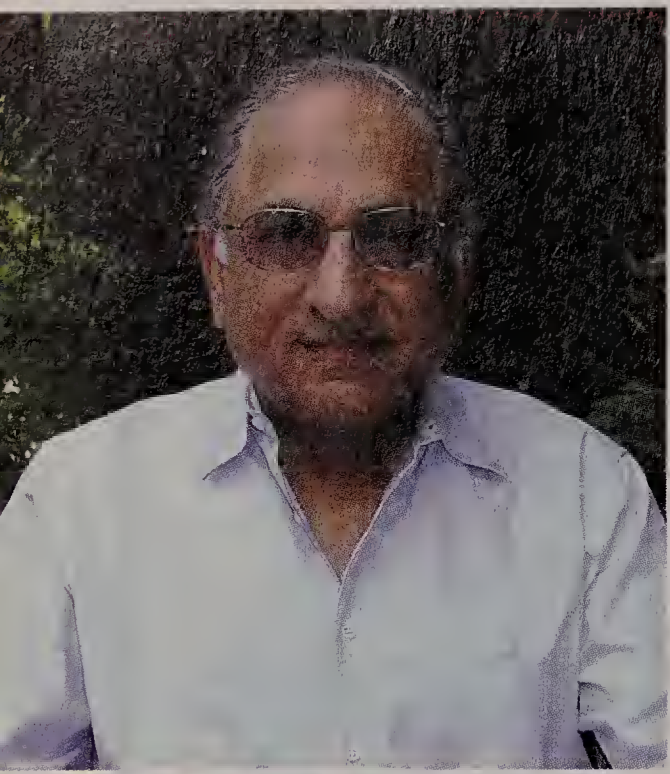
PHILOSOPHY IN A NUTSHELL: "Integrity in personal and business life is of utmost importance."

FAVORITE VICES: "I have two: Talisker single malt scotch and, when I get to Canada, a Cuban cigar."

The IT community has known you for years as the founder and president of the Center for Project Management, but your avocation has to do with food. Is there an IT connection? Having a long-term interest in cooking and nutrition, I have keenly observed the eating habits of IT people all over the country. Too many IT professionals' meals could be summarized as multiple shots of caffeine aided by big gulps of trans fats.

In the U.S., the food nourishment quality is going down and the quantity is going up. Then they have to drink caffeine because they can't stay awake.

In the office, people don't move more than three feet from the keyboard. The food is here, the coffee is there, and the keyboard is in the middle. IT people are



> **“[In Spain] one of the elevators in the hotel building had a sign that read, ‘Occupancy 5.’ Someone had crossed it out and jotted down, ‘Or 3 Americans.’**

so focused by nature on the problems they deal with that they overlook the joy and variety of eating.

It is quite interesting that most IT professionals spend much time and energy making their hardware and software more efficient and effective. They are very concerned about viruses, and they install firewalls and surge protectors. But when it comes to their own bodies and minds, there are no junk-food walls and there are no sugar surge protectors. It’s an unrestricted flow of junk food all day long.

Unfortunate, but if that’s what it takes for some IT folks to be productive, who are we to say it’s a bad idea? I don’t believe they are that productive; perhaps awake but highly stressed and not up to speed. The human body is a well-designed machine, but too many IT professionals feed it toxic fuel — packaged, processed and chemical-loaded foods. This poor-quality fuel stresses their physical, emotional and spiritual systems and leads to general malaise, which means poor performance. So many have to consume massive quantities of highly caffeinated drinks just to look awake. I don’t think people would want their surgeon or their airline pilot in that shape.

Granted. But still, isn’t the Twinkie life just a personal choice? It’s more than that. I would encourage IT people to be more cognizant of the carbon imprint of their food habits .

Can you explain? Let me don my project management hat and lay out the steps typical processed and packaged food products go through: 1) harvesting, 2) shipment to factories, 3) processing (invariably, most natural energy elements are extracted and replaced with chemical additives), 4) packaging — paper, plastic, metals, 5) shipment to warehouses, 6) shipment to stores, 7) shopping by IT professionals, 8) cooking, 9) discarding paper, plastic and metal packaging, 10) eating, 11) waste removal and shipping.

As a project manager, exactly what do you do when a project doesn’t fit in time and space and money? You descope it. If energy is scarce, you do a work breakdown and take away the steps that use energy. The Eating Green program proposes to eliminate Steps 2, 3, 4, 5, 8, 9 and 11 — all high-energy-using steps. And here we have it: less energy, less waste. We have achieved our goal, and the project is successful.

If, just one day a month, most of *Computerworld* readers’ eating did not involve these seven steps, we would save massive quantities of energy and reduce waste. If they were to shop at nearby farmers’ markets, they would be eating more-nutritious foods and help save even more energy.

How might they get started on that? For busy IT professionals who have no time or skills to cook, our Eating Green program is the perfect solution, as it requires no cooking. Go to our Web site, *www.familygreensurvival.com*. Download our delicious recipes.

This seems like a big step for IT people, who, as a group, are viewed as pretty nutritionally illiterate. One of the things we as project managers and IT professionals have to do is prepare people for change. Everything we do brings change. This is no more than change management. So you do it at a slow pace. You don’t shift over completely in one day. That’s why we say try this once a month.

I notice your site goes beyond eating green to “survival eating.” Where did you get that idea? A while back, I was on a consulting assignment in Segovia, Spain. One of the elevators in the hotel building had a sign that read, “Occupancy 5.” Someone had crossed it out and jotted down, “Or 3 Americans.”

That got me thinking: People in the U.S. are eating too much, too often. Poor people in the developing countries survive on 800 to 1,400 calories a day, while an average American consumes upwards of 3,600 calories. And the waste of food is incomprehensible. Consider the complete disrespect for our abundance [demonstrated] by such activities as national food-eating contests.

So the idea is that one day a month, I will eat much less. My model will be hardworking poor people in other countries. So I put together a program, and that’s Survival Eating. The pledge is to try it and think about it, to eat with your family and talk about it.

We seem to have digressed pretty far from IT as we usually talk about it in *Computerworld*. Can you tie this all together for IT professionals? It is a fact that energy is scarce, and it’s not going to be abundant anymore. IT people know that if something is scarce, we need to use it more wisely and carefully. As good citizens of the U.S. and the world, we could do our part. And it so happens that that would also make us more healthy — that’s the side benefit. And if you do that by buying at local farms, you’re also supporting people near to you. All of this comes together; it makes a person a better person. I think it will happen, because IT people are people who are forward-looking. I have faith that they will do what is good.

— *Interview by* **Kathleen Melymuka**

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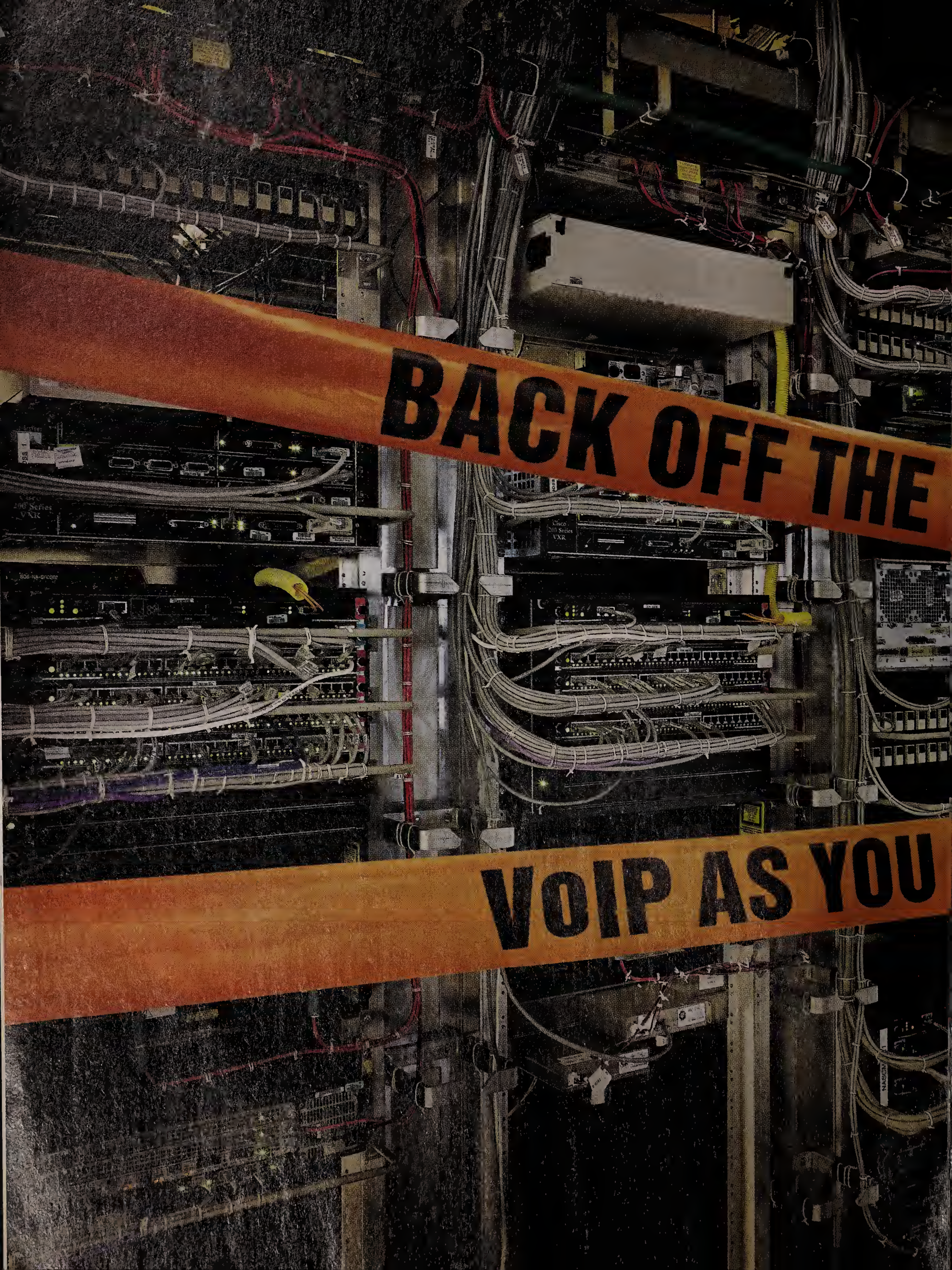
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OPINION

Scot Finnie

Peering Behind The Cloud

CLOUD COMPUTING is at its peak of hype. In fact, it's probably about to jump the shark. Savvy enterprise IT managers know there's little reason to embrace cloud this early in its development.

But, in fact, you *should* jump into some aspect of cloud computing right away. Yes, cloud is sketching the curve described by Gartner's July 2008 report "Hype Cycle for Emerging Technologies." Gartner analysts say cloud will begin delivering products and services that lead to mainstream adoption in two to five years. By my reckoning, cloud's "getting real" time will occur in 2010.

So, why would you want to dive in now, just as the technology is about to crest that first big roller-coaster peak of excitement and head for its deepest dip — the one that coincides with us all being sick of it? (Remember when Web 2.0 was a swear word?) Because cloud will emerge from the murky hype cycle, and if you haven't experimented with Internet-based enterprise applications and IT services by then, you may fall behind the curve.

The industry has been heading toward cloud-based computing for a long time. When the change comes, it will be transformational.

Cloud computing embodies two aspects: IT services and software as a service. Cloud began as similar concepts described with different terminology. So, grid and utility computing have become on-demand computing, which includes a raft of IT services. And Web services, ASPs and MSPs have become SaaS and platform as a service.

Whatever the terminology, SaaS is beginning to make serious inroads into the enterprise applications marketplace, and on-demand IT services are no longer a pipe dream.

One reason cloud computing is a hot topic is that things have come to pass that make old ideas more feasible, such as soaring server capacity, more modular Web-based architecture, IT spending's slowdown and the beginnings of enterprise interest in cloud- and SaaS-based computing.

The adoption of cloud computing will be driven by ROI, not technology.

Key questions remain about where cloud sits on the track between marketing and reality: Will it allow the replacement of large swaths of IT organizations, as some predict? Can it avert the need for large outlays for hardware and facilities? Is it both reliable and cost-effective? Is it truly available? Might you find yourself sliding down a slippery slope of rising expenses and customer service woes? What about security and privacy concerns if you outsource management of your data?

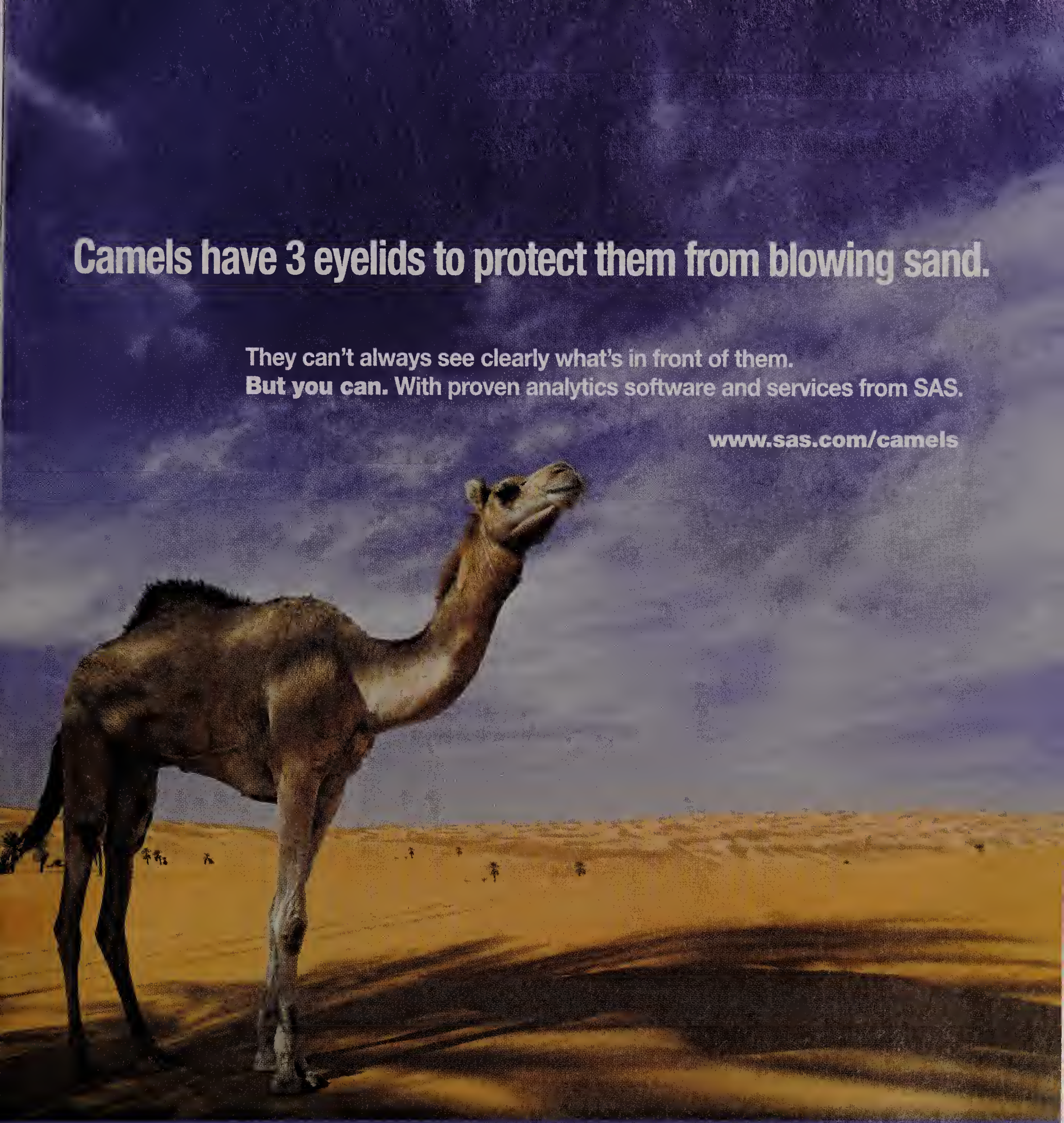
For most CIOs and IT organizations, cloud computing is a minefield right now. Its potential to cut costs on new efforts is tantalizing, but it comes with an attendant loss of control that's anathema to many IT pros. We're hearing about companies that have taken the plunge, but I don't think those early adopters are representative of the overall market. Most IT organizations just aren't ready to take a big chance on a technology that's barely out of the gate.

That's probably especially true of on-demand services from companies that want their cloud-delivered storage and virtual servers to become adjunct chunks of your data center. On the SaaS side, many products and services are ready to work, but they're not fully mature. The best is yet to come.

As ethereal as cloud computing seems right now, there is substance there, including real utility and potential cost savings. But to gain any advantage, you have to get your feet wet, build vendor relationships and begin to understand what today's technology and service levels can and can't deliver.

Pick a small greenfield project to try it out. Or weave cloud into a project in a way that extends your application instead of replacing it. Experiment now so you'll be smarter about implementing cloud when vendors have more compelling offers. The ingredient that will drive cloud's eventual adoption won't be technology; it'll be cost savings and ROI. Don't wait for the pressure and allure of its potential cost savings to build before you get up to speed. ■

Scot Finnie *is* Computerworld*'s editor in chief. You can contact him at scot_finnie@computerworld.com.*



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TECHNOLOGY LAYERS
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THE RIGHT GEAR

Virtual HEADACHES

Storage virtualization is hot, and for good reason. But its benefits bring layers of complexity.

BY GARY ANTHES

THERE'S AN AGE-OLD CHOICE in IT — whether to adopt a "best of breed" strategy for the power and flexibility it can bring, or go with a single vendor for accountability and simplicity. J. Craig Venter Institute Inc. (JCVI) believes in best of breed. The genomic research company runs Linux, Unix, Windows and Mac OS in its data center. For storage, it draws on technology from EMC, NetApp, Isilon, DataDomain and Symantec.

"It's quite a heterogeneous environment," says computer systems manager Eddy Navarro. "Thankfully, we have a very talented staff here."

And a talented staff was just what was needed to master the many flavors of storage virtualization, which can make multiple physical disks look like one big storage pool. Like JCVI, many organizations are enjoying the lower costs and added flexibility of storage virtualization. But the benefits can come with some headaches. Here, five IT managers who have led successful storage virtualization projects offer advice for relieving the pain.

HEADACHE 1: Managing Multiple Vendors

For several years, JCVI had employed software-based virtualization in the form of Red Hat's Linux Logical Volume Manager, which allows logical partitions to span multiple disk drives. More recently, the company added hardware-based virtualization in the form of NetApp's V Series system to create a single virtual pool of storage consisting of EMC Symmetrix disks and legacy Clariion disks.

The Clariion drives, which came into the data center from a corporate merger, were being poorly utilized, Navarro says. Now, the NetApp V system reformats data going to and from the EMC disks, "and then you carry on just as if it's another NetApp system," Navarro says. That enabled JCVI to wring better performance from the legacy disks.

Each of JCVI's vendors makes its own unique contribution to a powerful and cost-effective storage architecture, Navarro says. But the diversity comes at a cost. "When you are talking about multiple vendors' hardware — and they compete with each other — it may not be the easiest thing to get support when something goes wrong," he says. "So you have to ensure compatibility first and foremost, and you have to know in advance something is going to work."

HOW TO COPE: Study the documentation, do your homework, and ensure that your approach has been tried before and is certified by the vendors, says Navarro. And if you don't have experienced technical staff, he adds, be prepared to hire some outside professional help.

ILLUSTRATION BY CHRISTOPHER SILAS NEAL

VIRTUALIZATION Pain Relievers

1. **Be realistic: This is going to be complicated.**
2. **Assign someone on staff who really knows the technology, or hire a consultant, at least at the beginning.**
3. **Do your homework. Read the documentation and understand the pieces and their interfaces.**
4. **Be sure that your gear and their interfaces are certified by your vendor(s) for the versions/releases that you have.**
5. **Consider upgrading your old storage gear when you go to storage virtualization.**
6. **Make sure you have thoughtful policies and procedures for maintenance and backups.**
7. **Guard against "virtual sprawl" (of both storage and servers).**
8. **Ask yourself: Do I really need this?**

HEADACHE 2:
Dealing With Extra Technology Layers

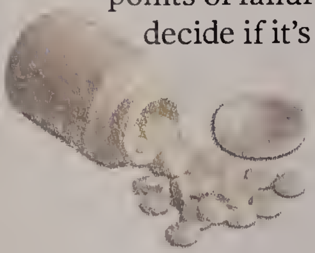
Even companies with less-complex environments report that although virtualization can ultimately simplify storage administration, putting it in place and tuning it is a demanding job.

Lifestyle Family Fitness, a rapidly growing chain of 60 health clubs based in St. Petersburg, Fla., is a Microsoft shop built around SQL Server and .Net development of Web applications. For storage virtualization, it uses IBM's SAN Volume Controller (SVC), disk arrays from IBM and EMC, and IBM Brocade SAN switches. IBM DS4700 disks provide 4Gbit/sec. Fibre Channel connections for the company's online transaction processing applications, while the Clariion drives handle less-demanding jobs like backups.

The IBM SVC was brought in to resolve an I/O bottleneck. The high-speed Fibre Channel drives and cache on the SVC appliance opened up the bottlenecks almost like an I/O engine would, says Mike Geis, director of IS operations. Moreover, the setup allowed Lifestyle Family Fitness to use its new IBM-based SAN while continuing to use its old EMC SAN. "In the past," he says, "you'd bring in a new SAN and have to unload the old one."

Geis says the SVC architecture promises vendor independence. He says he has a "great relationship" with IBM, but if that ever changed, he could easily bring in drives from another supplier and quickly attach them directly to his storage network. "We aren't held hostage by the vendor," he adds.

But the advantages come with some difficulties, Geis notes. "You are adding complexity to your environment. You add overhead, man-hours of labor, points of failure and so on. You have to decide if it's worth it."



HOW TO COPE: "Pick strong partners — both vendors and implementation partners — and make sure you are not their guinea pig," Geis advises.

HEADACHE 3:
Scheduling Maintenance/Backups

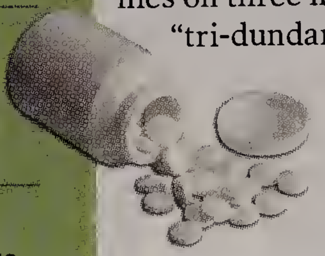
Ron Rose, CIO at travel services company Priceline.com Inc., takes a holistic view of virtualization. In fact, he speaks of a "virtualization sandwich" consisting of integrated technologies for server virtualization, storage virtualization and server provisioning. He uses 3PAR InServ S400 and E200 tiered disk arrays for storage, BladeLogic tools for provisioning, and 3PAR Thin Provisioning and other products for virtualization.

Rose says most companies could reduce their server and storage footprints by 20% to 40% using a virtualization sandwich. "And not only are there cost savings; there are green benefits. It's good for the planet," he says.

But like most practitioners of storage virtualization, Rose says there is no free lunch. "You have to plan your architecture more thoroughly and look at all your applications. The more systems you have running on the box, for example, the more challenging it is to schedule maintenance. If you have 10 applications running on that chunk of infrastructure that you are going to do maintenance on, you have to schedule it and move the apps to other machines in an orderly manner."

He says 3PAR has powerful tools that can hide much of the complexity of virtualization, but the kind of maintenance scheduling needed "is not a system or tool issue; it's a process and discipline issue."

Similarly, ensuring reliability requires extra care, Rose says. "As with maintenance, you don't want to get too many eggs in each basket," he explains. Priceline keeps critical files on three machines — what it calls "tri-dundancy."



HOW TO COPE: "Think of your entire virtual environment, not just storage," Rose advises. "You will get better ROI in aggregate if you think through all three layers of the virtual sandwich. And getting a little consulting from real experts early in the process will help you anticipate the entire environment."

HEADACHE 4:
Setting Up Management Tools

Like Rose, Jon Smith takes a very broad view of virtualization. "For me, a server is no different from a hunk of data storage, and I can move it wherever I want," says the CEO of ITonCommand, a hosted IT services provider. "Whether it's running the operating system or it's just data, it's all storage."

Smith says that eventually virtualization technology will enable any data to go anywhere — on direct-attached storage when high performance is needed, or somewhere on a SAN when speed is less critical and a higher level of redundancy is required.

ITonCommand uses HP BladeSystem c3000 disks for direct-attached storage, and LeftHand Networks Virtual SAN Appliances and LeftHand's SAN/iQ software on an HP StorageWorks array for storage virtualization on its iSCSI SANs.

The company is now standardizing on Microsoft's Hyper-V hypervisor, part of Windows Server 2008, for server virtualization and on Microsoft's System Center Virtual Machine Manager for administration.

The glue that holds everything together, Smith says, is Microsoft's new Virtual Machine Manager for provi-

Continued on page 28

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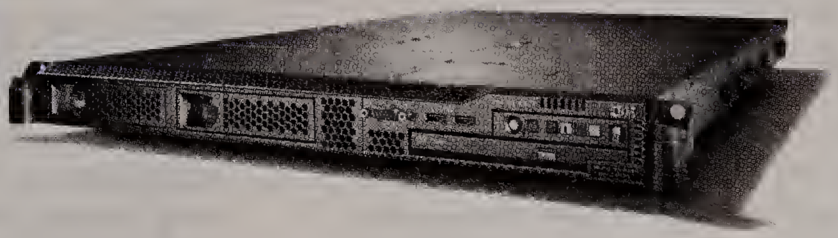

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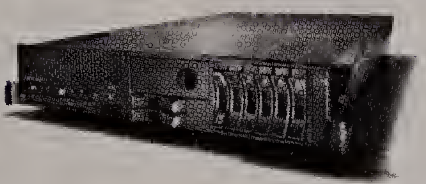

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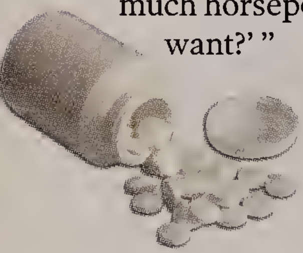
Continued from page 26

sioning and managing physical and virtual computers. "With VMM on a display, a system admin can look at all the virtual servers' hypervisors across my whole environment, all in one spot, and adjust them," he says. "It's pretty cool stuff."

It's cool when it's set up, but getting there isn't so easy, he acknowledges. "System Center is new, and so is [Hyper-V]. It took us a while to figure out how to connect all our old virtual machines into the hypervisor. It's not the easiest setup out of the box."

Smith says continued virtualization at ITonCommand will result in a true "utility computing" model for his clients. "It will take a while, but people will stop thinking of physical boxes running one operating system. Hardware will be nonexistent to the end user. It's just going to be, 'How much horsepower and storage do you want?' "



HOW TO COPE: "Find an expert who knows virtual technology and knows Microsoft System Center," says Smith.

HEADACHE 5:
Getting the Right Gear

Babu Kudaravalli, senior director of business technology operations at National Medical Health Card Systems Inc., gives this definition of storage virtualization: "The ability to take storage and present it to any host, of any size, from any storage vendor." He's pursuing those goals with three tiers of storage, each supported by a different HP StorageWorks product. The technology used in each tier is chosen for the mix of cost, performance and availability it offers.

Kudaravalli uses high-end HP XP24000 disk arrays for the most demanding and mission-critical applications, lower-cost Enterprise Virtual Array 8000s for second-tier applications, and Modular Smart Array 1500s for archiving, test systems and the like. His five SANs hold 70TB of data, of which about 35TB in the EVA and MSA tiers is virtualized, he says.

Kudaravalli says there are several things to be careful about when buying storage virtualization products. First, be aware that vendors typically certify their products to work with the latest versions of other vendors' products. If you don't have those exact versions, your interfaces might not work. He says this is a good reason to think about replacing your old gear when you go to a heterogeneous storage environment — or at least to keep current on the latest releases.

Second, Kudaravalli says that although virtualization should ultimately simplify storage management, setting up a virtual system is complex. Careful planning and an understanding of the limitations of products is crucial.

A few years ago, vendors had very different definitions and standards for virtualization, says Kudaravalli. "But now they seem to be coming together," he says. "They are trying to offer similar features and capabilities, but it is not completely mature."

HOW TO COPE: Although storage virtualization is often undertaken to better utilize existing resources, it may have a perverse impact, says Rick Villars, a storage analyst at IDC. "The whole point of virtualization is to make it easier to provision or move a resource, to create a new volume or another snapshot, or to migrate data from one system to another," he says. "But when you make something easy to do, people are induced to do it more often."

According to Villars, volumes, snapshots, data sets and even applications can needlessly proliferate. "You can go from being more efficient to more wasteful. It's just what can happen with virtual server sprawl." Preventing that is a matter of policies, procedures and good business practices, not technology, he says.

Users agree that there are many technical details to master when pursuing storage virtualization. But Navarro suggests starting with a basic question: Why am I doing this? "Virtualization is a hot word, a big thing. But is it really necessary? There are benefits, but ask yourself if you are doing it for the right reasons, or just because you want to be on the cutting edge. It's very easy to get swept up in these groupthink movements." ■

How Am I **DOING?**

ONE OF THE IDEAS behind virtualization is to "abstract" the physical layer in IT from the software layer, to in essence mask hardware boundaries from the application and the application's users.

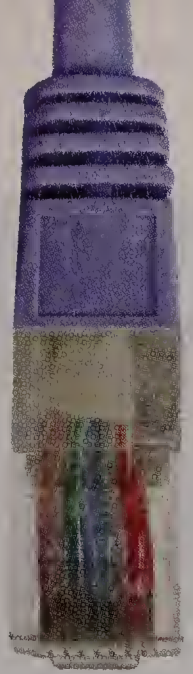
But the benefits of hiding the physical resources – greater flexibility, better utilization and potentially easier administration – come at a price, says Eddy Navarro, computer systems manager at J. Craig Venter Institute.

"So you have this abstracted area of storage, and you have a performance issue," he says. "In the traditional model, it's a straightforward deduction to say that this area maps to these disks so that must be where the hot spot is. But with virtualization, if things are running slowly and there's this amorphous pool of storage, where exactly is the problem? You want to make sure you have the proper tools to tell you where the problems are."

Storage virtualization vendors have tools for performance monitoring and troubleshooting. "But with these enterprise tools, it's a matter of installing agents everywhere, and it can balloon out of control," Navarro warns. "The agents themselves can cause this giant admin task. So is it really worth it to have this huge application monitoring things, or do you want a little bit of smarts and do some in-house work to write some custom scripts to tell you what's going on?"

JCVI has chosen to apply carefully targeted smarts via some homegrown software. "Fortunately," Navarro says, "we have the technical expertise to do that. If you don't, it's not easy to set that up."

– GARY ANTHES



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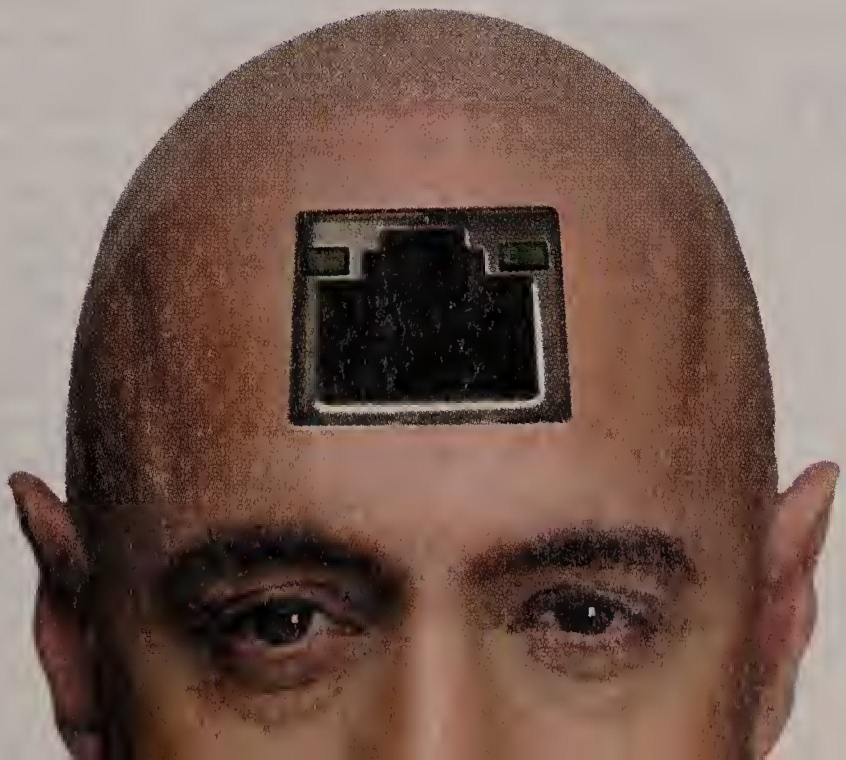


PHOTOGRAPH COURTESY OF NASA

« Storage virtualization proved to be the most cost-effective way for NASA to store a universe's worth of images.

Your Own Virtualization Flight Test

Five questions to ask before launching a storage virtualization project.

BY STACY COLLETT

NASA'S Infrared Processing and Analysis Center wasn't shooting for the stars when it turned to virtualization to meet its storage needs. IPAC's cash-strapped effort to record images of our universe — up to 30 million objects captured each night and 42 billion records over the life of the project — required big storage capabilities, and the engineers needed them fast and at a low cost.

"We were trying to find a way to step outside of the normal storage purchases to meet our 'high performance and high availability on a budget' requirements," explains Eugean Hacopians, senior systems engineer at IPAC in Pasadena, Calif. IPAC had already purchased a shared-storage system from Seanodes Inc. in Cambridge, Mass., to get control of its clusters with multiple compute nodes.

But Hacopians soon learned that he could put storage on the nodes and that they could work as compute servers and storage servers — without additional costs or upgrades.

"In general, I'm not really fond of virtualizing things," he says. In his mind, "everything has its own place. But it's a solution that fits a need."

Indeed, virtualization can offer a solution for many storage challenges. But it can also be costly to buy and complex to implement, and it might require you to purchase equipment you didn't need before, such as new switches or servers. How do you decide on the right approach and choose the right vendor? Industry watchers suggest five key questions to ask yourself and your prospective vendors before selecting a storage virtualization technology.

1 WHAT PROBLEM ARE YOU TRYING TO SOLVE?

The term *storage virtualization* has become a catchall phrase used to refer to many types of technology that make more efficient use of your storage assets. It can also bring these assets under a single management umbrella with a single point of control.

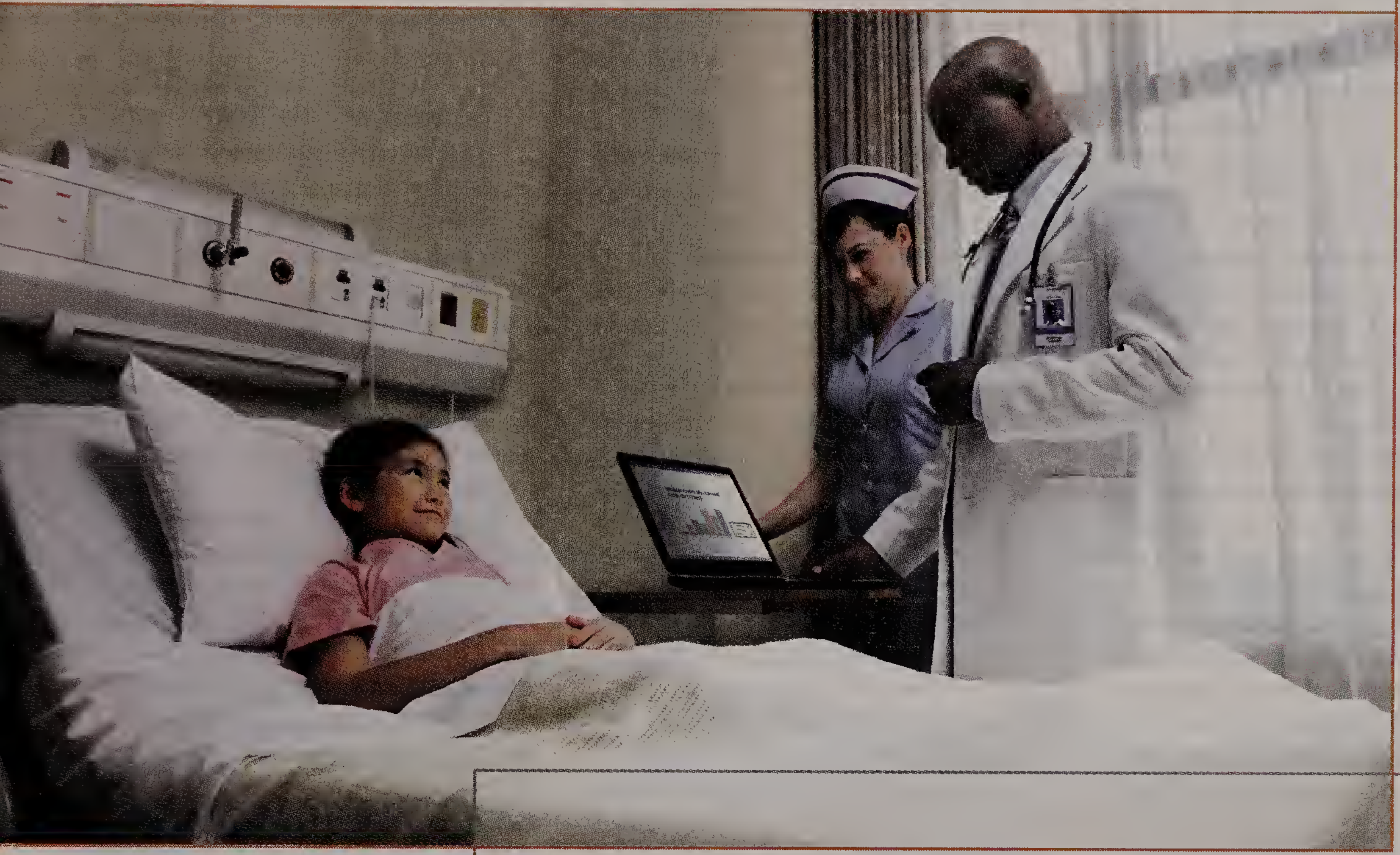
Since storage virtualization comes in all shapes and sizes, first determine what level of storage you're trying to optimize. Is the pain point at the block level, file level or tape library?

For block-level storage, virtualization can help consolidate large, disparate soft assets in the form of storage tiers, or it can simply bring them all under one roof.

At the file level, virtualization comes in handy when companies develop too many islands of network-attached storage. "[If] your users are storing data all over the place, and you can't back them all up under a single roof, you use storage virtualization to bring all that under a single umbrella, and everyone accesses it through a common [naming convention]," explains Ashish Nadkarni, principal consultant at GlassHouse Technologies Inc.

At the tape library level, virtualization is used for making online storage appear as tape to the backup software.

Continued on page 32



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Continued from page 30

2 DO YOU WANT HOST-, NETWORK- OR ARRAY-BASED VIRTUALIZATION?

When deciding what type of virtualization is best, "it really comes down to what problem you're trying to solve and what kind of vendor affinity you have," Nadkarni says.

For most IT units, having host-based virtualization is a given, since volume managers run on the host. More often than not, you'll see host-based virtualization in a storage-area network (SAN) environment.

"Array-based virtualization is more of a function of which vendor you're going with for your primary storage," Nadkarni says. For example, with some Hitachi Data Systems storage products, virtualization can be deployed by enabling an existing software key within HDS's Universal Storage Platform or its Network Storage Controller. "So you'll go with array-based if you plan to buy a Hitachi frame for your Tier 1 storage," he says.

Network-based virtualization is typically used if you plan to make your SAN a multiprotocol storage network and in doing so are porting the network intelligence — which also includes virtualization. Cisco Systems Inc. and Brocade Communications Systems Inc. are now coming out with products that let you virtualize within the network, without the need for an array or a host to do anything.

Some products blur the lines between host-, array- and network-based virtualization. "Products like Seanodes' would be considered host-based virtualization because you're virtualizing over the nodes," Hacopians explains. "You could also think of it as network-based, because you're virtualizing and spreading it across and letting the network take care of itself."

Industry watchers agree that virtualization might be easier to implement and cost less if IT groups stick with their vendors. "If you're primarily in a Hitachi environment, for example, array-based virtualization is probably going to make the most sense," Nadkarni says. "If you're a Cisco SAN, and you already have the infrastructure to implement Cisco virtualization, then network-based makes more sense."

3 HOW MUCH COMPLEXITY CAN YOU HANDLE?

Host- and array-based virtualization are usually the easiest to implement, experts say. Network-based systems are often the trickiest because there is no direct way of virtualizing in a network. Most IT shops use third-party appliances. Cisco's system usually requires users to buy enabler software or an appliance or other third-party tool that sits alongside it, Nadkarni says.

"Then you have to figure out whether it's going to be asymmetric or symmetric," he says. "Where are you going to store your depository? What services do you want to provide? What arrays are you going to virtualize?"

In an array-based setup, "you take your second-tier arrays and just virtualize them behind your existing arrays. It's one view to the whole world — like having one entrance to

The terra firma for IT vertigo.

the office," Nadkarni adds.

Gene Ruth, an analyst at Burton Group, says the simplest approach is to choose an all-inclusive system, add appliances and then link them. But beware of diminishing returns. "At some point, it just gets complicated, and it may not be worth it when you aggregate too many appliances," Ruth says. "Then you have to ask yourself, is it better or are you getting this lowest common denominator?"

The hardest part is the planning phase, says Roman Perez, systems engineer at Business Technology Partners Inc. in New York. "If you have a big company with thousands of servers, you have to do it little by little, and that's a big project," he says.

4 WHAT'S YOUR BUDGET?

"It's always cheaper when it's well thought-out and part of a bigger project," Nadkarni says. Your budget will depend on the type of virtualization you need. Block-level virtualization is cheaper if you implement it as part of your upgrade. If you're buying or implementing a new SAN, then incorporating storage virtualization within the SAN is more prudent than buying off the shelf. "It tends to be pricey because you're now trying to 'a la carte' it. Do it as part of a larger upgrade so you can bundle some costs into the upgrade itself," says Ruth.

He also recommends that IT managers compile a spreadsheet to compare those scenarios. Adding appliances could be cheaper in tough economic times, but be sure to amortize the cost over three to four years, since older systems will eventually need to be replaced.

For virtual tape libraries, it's important to correctly estimate virtualization needs — or risk buying much more capacity than you need.

5 DO YOU HAVE AN EXIT STRATEGY?

Keep in mind that network-based virtualization can get tricky, Nadkarni says. "It can get a little complex over time, so you have to make sure that whatever architecture you're implementing [can be withdrawn from]," he says. "You shouldn't be stuck with it."

Most storage virtualization products create metadata from your data. That's how the storage objects they virtualize are managed. "Unvirtualizing means figuring out how to reappoint your metadata back to original data," Nadkarni explains. "The second problem is, your data could be across multiple storage areas or multiple objects. In that case, you now have a challenge of trying to present the same data, in a committed manner, back to the host again."

Storage virtualization isn't an insurance policy against sloppy practices, Nadkarni says. "It's almost like taking a dirty room and stuffing everything that's out of place into a closet," he says. "You really need to put things back into their place. So storage tiering or other good storage practices need to be taken care of first. Then you can move to the next step and implement storage virtualization." ■

Collett *is a* Computerworld *contributing writer. Contact her at stcollett@aol.com.*

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Storage Virtualization

Maximizing the benefits of pooled storage. BY RUSSELL KAY

MANAGING DISK storage was once simple: If we needed more space, we got a bigger disk drive. But data storage needs grew, so we started adding multiple disk drives. Finding and managing these became harder and took more time, so we developed RAID, network-attached storage and storage-area networks. Still, managing and maintaining thousands of disk drives became an ever more onerous task.

The latest answer to this dilemma is storage virtualization, which adds a new layer of software and/or hardware between storage systems and servers, so that applications no longer need to know on which specific drives, partitions or storage subsystems their data resides. Administrators can identify, provision and manage distributed storage as if it were a single, consolidated resource. Availability also increases with storage virtualization, since applications aren't restricted to specific storage resources and are thus insulated from most interruptions.

Also, storage virtualization generally helps automate the expansion of storage capacity, reducing the need for manual provisioning. Storage resources can be updated on the fly without affecting application performance, thus reducing downtime.

TECHNICAL MATTERS

Because virtualization operates as an intermediate layer, it becomes the primary interface between servers and storage. Servers see the virtualization layer as a single storage device, while all the individual storage devices see the virtualization layer as their only server. This makes it easy to group storage systems — even devices from different vendors — into tiers of storage.

This layer shields servers and applications from changes to the storage environment, letting users easily hot-swap a disk or tape drive. Data-copying services are also managed at the virtualization layer. This means that data replication, whether for snapshot or disaster recovery, can be handled entirely by the virtualization system, often in the background, with a common management interface. Because data can be moved at will, lightly used or outdated data can be easily moved to slower, less-expensive storage devices.

Storage virtualization can be structured in three ways:

Host-based. Here, physical drives are handled by a traditional device driver, while a software layer above the device driver intercepts I/O requests, looks up metadata and redirects I/O.

Storage-device-based. In this type of setup, virtualization can be built into the storage fabric; for example, newer RAID controllers allow other storage devices to be attached downstream. A primary storage controller (usually a dedicated hardware appliance, though some systems now use switches) handles pooling and manages metadata, allowing the direct attachment of other storage controllers. Such systems may also provide replication and migration services across different controllers.

Network-based. In this configuration, storage virtualization is viewed as a network-based device, generally using Fibre Channel networks connected as a SAN. Here, too, an appliance or switch-based implementation is most common.

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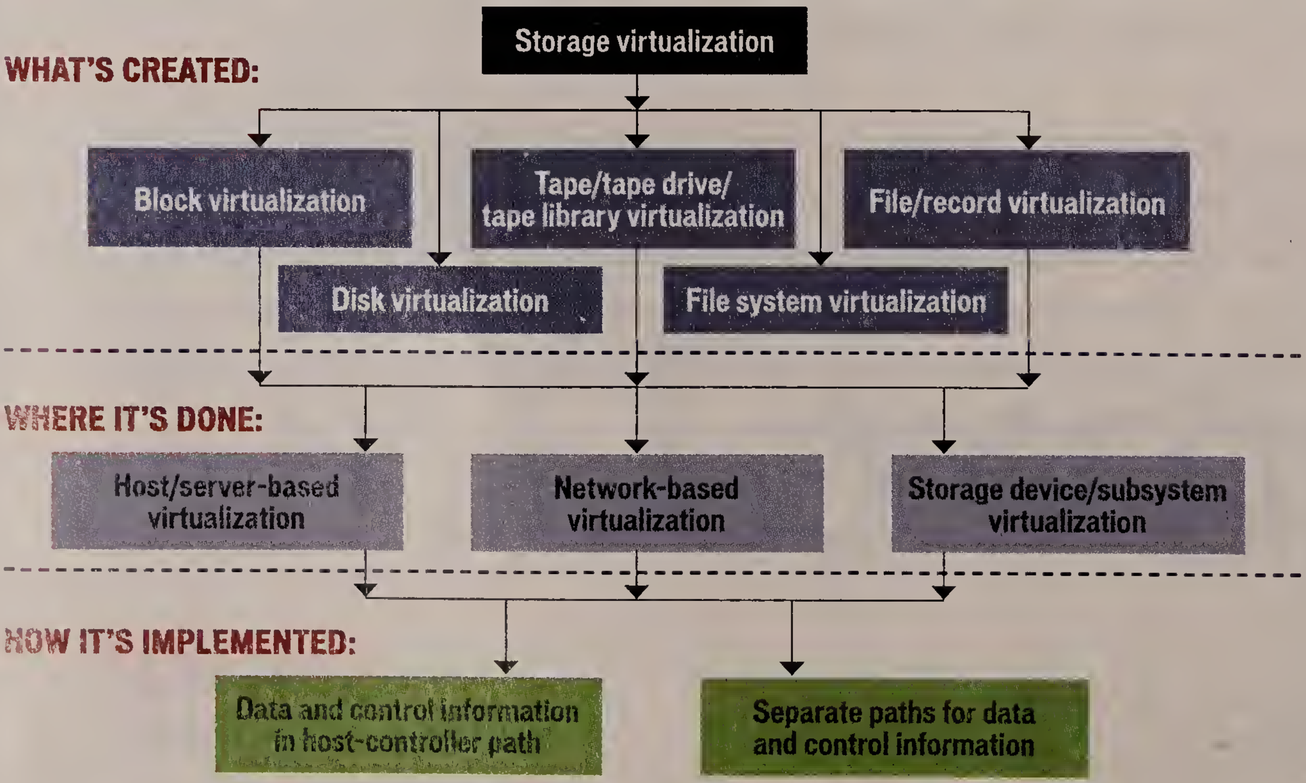
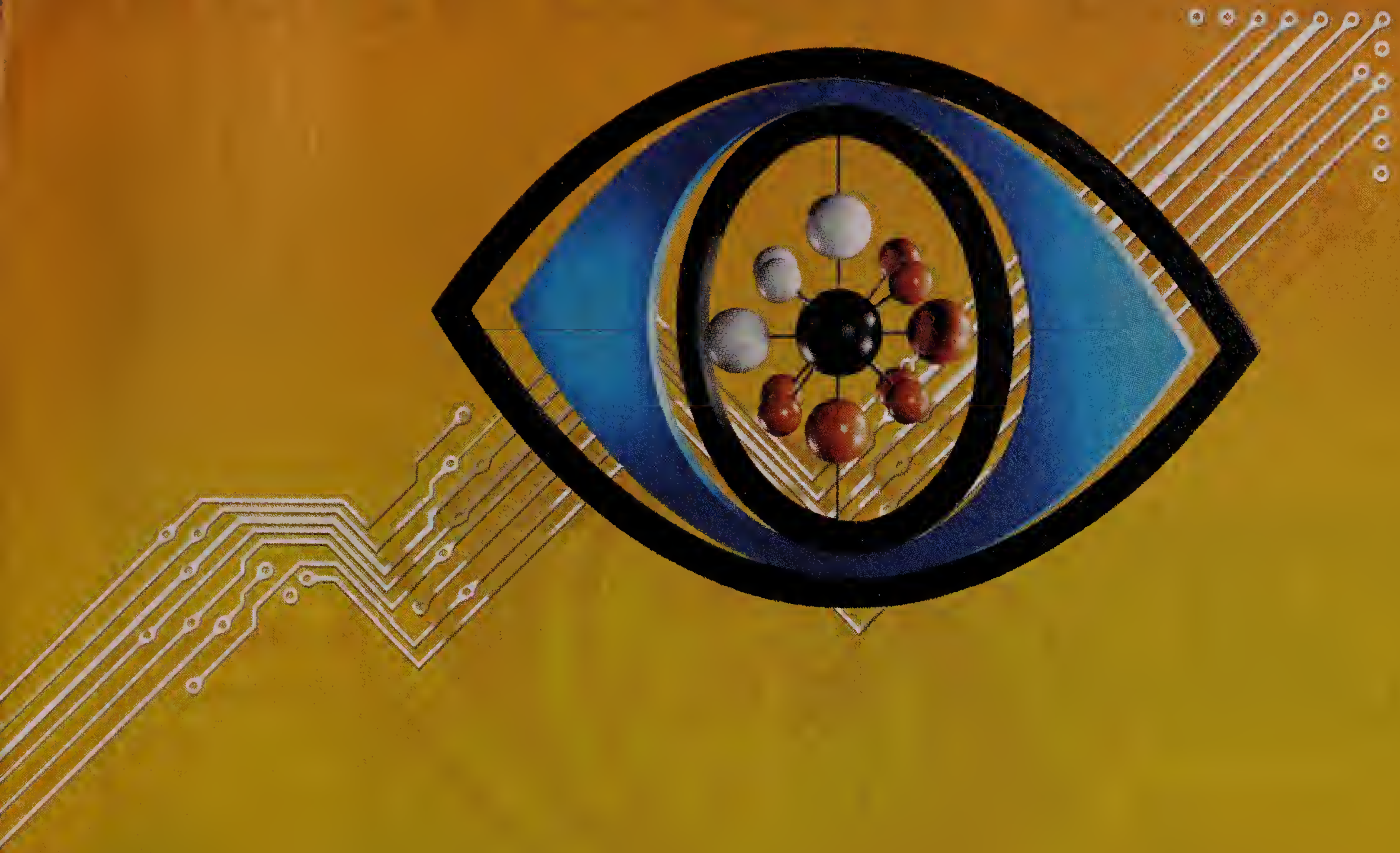
Experienced users agree that all three approaches can work well. But although virtualization promotes cross-vendor storage utilization, most implementations lock you into a specific vendor. ■

Kay *is a* Computerworld *contributing writer in Worcester, Mass. Contact him at russkay@charter.net.*

VIRTUAL CLARITY

This Storage Networking Industry Association model shows the various types of storage virtualization and where they are deployed and implemented.


Storage virtualization
WHAT'S CREATED:
Block virtualization
Tape/tape drive/ tape library virtualization
File/record virtualization
Disk virtualization
File system virtualization
WHERE IT'S DONE:
Host/server-based virtualization
Network-based virtualization
Storage device/subsystem virtualization
HOW IT'S IMPLEMENTED:
Data and control information in host-controller path
Separate paths for data and control information



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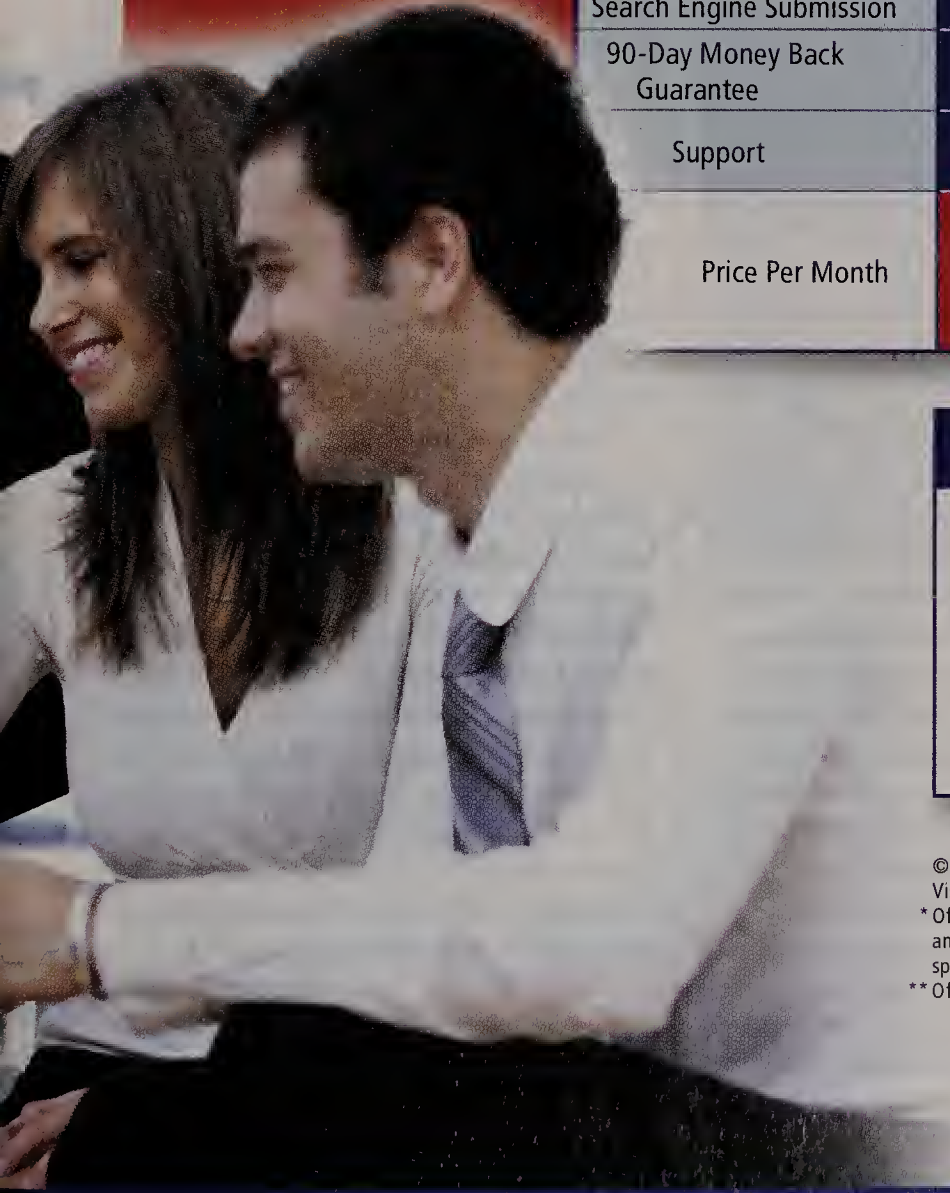

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The Virtual Mind-set

Storage staffers can make the leap to managing virtual environments, but not without targeted training. BY THOMAS HOFFMAN

AS COMPANIES are diving deeper into virtualized storage projects, IT managers are getting a better understanding of the staff skills they need to make those projects succeed. The exact talents required depend on the type of storage implementation, but most employers say they're in the market for two kinds of IT worker: technicians with vendor-specific SAN or NAS knowledge, and systems administrators and IT architects who understand the complexities and interdependencies among applications, operating systems and I/O, all of which affect storage requirements.

But the different approaches to storage virtualization demand different skills. For example, IT organizations that have created virtual server farms have typically relied on storage professionals who are knowledgeable about the types of platform being used and how best to allocate storage for those configurations, says Vincent Franceschini, chairman of the Storage Networking Industry Association in San Francisco.

"Nobody's an expert yet. We're all still learning this as we go along.

STEVE DAVIDEK, CONNECT BOARD MEMBER AND SYSTEMS ADMINISTRATOR, CITY OF SPARKS, NEV.

"We need sourcing talent that not only knows how to contract [for virtualization services] but to monitor that contract successfully.

BOB DAVIS, VICE PRESIDENT OF GLOBAL STRATEGY, CHANGE AND PERFORMANCE, XEROX INFORMATION MANAGEMENT

That's one reason why IT leaders and industry observers say systems administrators and IT architects have skills that can help organizations manage storage virtualization efforts. Workers with such backgrounds are typically adept at configuration management and understand how storage, or "block," virtualization interrelates with disciplines such as disaster recovery planning and server clustering, says Irwin Teodoro, director of engineering at Laurus Technologies Inc., a systems integrator in Itasca, Ill.

What's needed is targeted instruction in how virtualization works.

For example, IT professionals who want to get involved with storage virtualization "need to know how the operating systems treat disk or what the disk limitations are to be successful in this environment," Teodoro says. Plus, systems administrators "are familiar with some form of data storage layout, and what you find is that 80% to 90% of storage administrators have backgrounds in systems administration," he adds.

The importance of those technical and process interrelationships in storage virtualization efforts also helps explain why there's strong demand for IT professionals who have ITIL process-transformation experience, says Brian Brouillett, vice president of data center services at Hewlett-Packard Co.

HOMEGROWN TALENT

Meanwhile, IT organizations crafting their own virtualized storage environments often use their existing SAN or NAS technologies and draw on IT staffers who are experienced with them, says Rick Villars, an analyst at market research firm IDC. Employees who are adept at tuning system performance and optimizing system utilization can help make those technologies more cost-effective in a virtualized environment, he says.

For at least some members of Share, an IBM user group, the goal is to simplify their organizations' virtualization efforts as much as possible "so you don't have to go out and find a storage virtualization expert," says Robert Rosen, a past president of Share and CIO at the National Institute of Arthritis and Musculoskeletal and Skin Diseases in Bethesda, Md. Instead, many IT managers are opting to tap "well-rounded" systems administrators who can be trained, Rosen says.

That might also be a more financially prudent approach. According to David Foote, chief research officer at management consultancy Foote Partners LLC, the average base pay for senior SAN administrators in the U.S. is $96,478. Foote Partners doesn't classify storage virtualization as a separate job category because those tasks are typically a component of what a SAN administrator does, says Foote. Nevertheless, IT professionals with such skills have commanded a 6.7% compensation increase over the past six months, he says.

Foote says employers prefer to develop their own IT staffers with virtualization skills — including those with sought-after security and networking acumen — instead of hiring contractors. That's partly because contract workers with such skills "don't come cheap," he notes.

Although most employers look for technicians with specific types of

4-Step Skills Analysis

STEP 1: Clearly understand what you're trying to achieve with storage virtualization. Is this project part of a broader virtualization deployment strategy? Or is it designed for a specific use, such as tiered storage, disaster recovery or basic resource management? Make sure you fully understand what you want to achieve (or overcome) by deploying storage virtualization.

STEP 2: Assess your current skills and identify gaps. Look across your IT staff for relevant and related skills. Is your storage specialist virtualization-savvy? Do you have IT workers with years of relevant mainframe or system virtualization experience? Look at your virtualization project to see whether any specific platform integration will be required (for example, hypervisors, clustering or data sharing).

STEP 3: Evaluate independent training and certification. Before conducting vendor analysis, make sure you've addressed potential skills gaps in order to make an assessment of different approaches to virtualization and how they might fit into your organization's existing infrastructure.

STEP 4: Consider vendor-specific training. Storage virtualization approaches vary from vendor to vendor, so if you have selected a new vendor or are expanding work with an existing vendor, you will likely need some custom training to ensure that you're taking advantage of all the features the vendor provides.

SOURCE: STORAGE NETWORKING INDUSTRY ASSOCIATION, SAN FRANCISCO

storage and virtualization expertise — including iSCSI and Fibre Channel experience — having a solid storage management background is a critical asset, says Babu Kudaravalli, senior director of operations for the business technology services division at National Medical Health Card Systems Inc. (NMHC) in Port Washington, N.Y.

"It's a very laborious and manual process to deploy storage," he says. "You have to have an expert or experts who absolutely know what they're doing to manage the storage."

NMHC began creating its own virtual storage environment using HP StorageWorks Enterprise Virtual Arrays in late 2002, says Kudaravalli. To help strengthen its knowledge base in this area, the company has cross-trained some of its Unix and Windows administrators, he says. That approach has not only provided growth opportunities for some of its IT staffers, but it has also been cost-effective for NMHC, says Kudaravalli.

For example, although its storage capacity has swelled from 5TB to 6TB in 2002 to about 70TB today, the company hasn't experienced a corresponding increase in manpower, says Kudaravalli. "We still have to manage the same amount of dollar figure, but we have to do more," he says. "That's why there's more emphasis on cross-training."

> "[IT professionals] need to know . . . what the disk limitations are to be successful in this environment.
>
> **IRWIN TEODORO**, DIRECTOR OF ENGINEERING, LAURUS TECHNOLOGIES INC.

Besides, these types of nascent skills are tough to find. It's particularly challenging in the public sector because storage virtualization specialists must also have the necessary security clearances to do the work, says Rick Gonzalez, vice president of strategic alliances at NJVC LLC, a Vienna, Va.-based government services provider. In fact, IT professionals with security credentials typically command $5,000 to $10,000 above the standard market rate for people with storage virtualization skills alone, he says.

And the human resources needs are even more complex at companies like Xerox Corp., which manages some of its storage internally while also using storage virtualization services from third-party vendors.

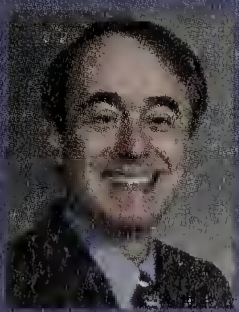
"We need sourcing talent that not only knows how to contract [for virtualization services] but to monitor that contract successfully," says Bob Davis, vice president of global strategy, change and performance at Xerox Information Management, a predominantly outsourced IT organization with about 800 employees.

THE TRAINING YOU NEED

Storage vendors such as EMC, IBM, Hitachi Data Systems and HP offer extensive training for users of their storage systems. HP, which is an authorized training partner of virtualization vendor VMware Inc., has provided training to 10,000 people, says Nancy Lunger, general manager of HP Education Services.

Virtualization training classes offered by local user groups can also be useful — and they're popular. For example, a northern Nevada chapter of the HP user group Connect hosted a storage virtualization training session in May that attracted 42 people, says Steve Davidek, a Connect board member who is also a systems administrator for the city of Sparks, Nev. In contrast, the previous Connect meeting for that chapter drew 20 people. Similar virtualization classes around the country have also been well attended, he says.

Even though some IT organizations have been involved with various types of virtualization for a few years, storage virtualization is still a brave new world. "Nobody's an expert yet," says Davidek. "We're all still learning this as we go along." ■



> "[The goal for some IT managers is to simplify their virtualization efforts] so you don't have to go out and find a storage virtualization expert.
>
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Finalists in each of the following categories are:

Innovation and Promise

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- Joe Gibbs Racing, Huntersville, North Carolina
- LA Valley College, Los Angeles, California
- Partners HealthCare, Wellesley, Massachusetts
- University of Illinois, Urbana-Champaign, Illinois

Planning, Designing and Building a Strategic Storage Infrastructure

- AOL LLC, New York, New York
- East Carolina University, Greenville, North Carolina
- LandAmerica Financial Group, Glen Allen, Virginia
- Latin School of Chicago, Chicago, Illinois
- Tasty Baking Company, Philadelphia, Pennsylvania

ROI and Best Practices in Green Computing and the Data Center

- Hilton Grand Vacations Club, Orlando, Florida
- Marina Medical Billing Service, Inc., Cerritos, California
- Priority Health, Grand Rapids, Michigan
- Quantcast, San Francisco, California
- Sybase, Inc., Dublin, California

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- Air Force Center for Engineering and the Environment, Brooks City-Base, Texas
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Program Judges' Criteria

Judges evaluated and ranked the finalists in each category according to their substantiated storage networking solution attributes and achievements against a set of criteria such as:

- Financial return and measurable payback (returns on investment, assets, resources) through created/protected revenue opportunities or cost savings.
- Strategic importance to the business
- Substantive customer impact (service, retention, acquisition)
- Positive impact on other business/organization units.
- Addresses system and department interoperability issues and heterogeneous platform integration challenges
- Provides a strategic advantage to the business/organization while anticipating and accommodating the deployment of future storage networking solution initiatives.
- Supports the efficient and reliable data, information and application sharing/access between personnel, departments, divisions, etc.
- Addresses challenges of data, information and application security, recovery, business continuity, etc.

James Damoulakis

Three Degrees of Storage Virtualization

SURVEY AFTER SURVEY indicates that interest in and adoption of storage virtualization is increasing. But I cringe a bit when I see those surveys, because it's often impossible to determine what the numbers really tell us. How does each respondent define *storage virtualization*?

Unlike server virtualization, which represents a clearly understood product category, storage virtualization has come to represent an assortment of technologies and approaches. Given vendors' eagerness to attach their products in any way, shape or form to the "V" word, more often than not, the term *storage virtualization* requires more explanation.

Virtualization, after all, is a technique that over the years has been employed in almost every facet of storage technology: disk, controller, array, SAN, LAN and even host (think logical volume manager). At the risk of oversimplification, I'd suggest that there are three broad categories: inside the box, outside the box and tape emulation. Each of these offers distinct benefits as well as some commonalities.

Inside-the-box virtualization. All storage virtualization approaches involve pooling some quantity of physical storage and creating logical abstractions of subsets of that storage. "Inside the box" refers to storage systems that make use of virtualization internally. You could say that this would include every storage array sold today, and, in a sense, you'd be right. It's the degree of abstraction that differentiates a "traditional" array from a virtualized one. A virtualized array aggregates large numbers of disks, often in a gridlike manner, and then creates and presents virtualized volumes from those disks. Thus, I/O operations typically span a larger number of spindles than in a traditional array.

What are the benefits? One would be ease of management — creating, presenting, expanding, shrinking, copying and deleting logical storage in these systems involves fewer steps than with traditional arrays. Another can be performance — a common bottleneck is the I/O capability of a small set of disks, and by striping widely across many spindles, virtualized arrays can overcome this limitation.

> ■ **Virtualization is a technique that over the years has been employed in almost every facet of storage management.**

Outside-the-box virtualization. This technology was designed to provide a virtualized layer of common services that can be applied across a number of potentially heterogeneous arrays. To many, this represents the true intent of the term *storage virtualization* — the ability to aggregate storage pools beyond the confines of a single array. This approach leverages various combinations of intelligent switches and appliances to provide volume management, snapshot, cloning and replication capabilities.

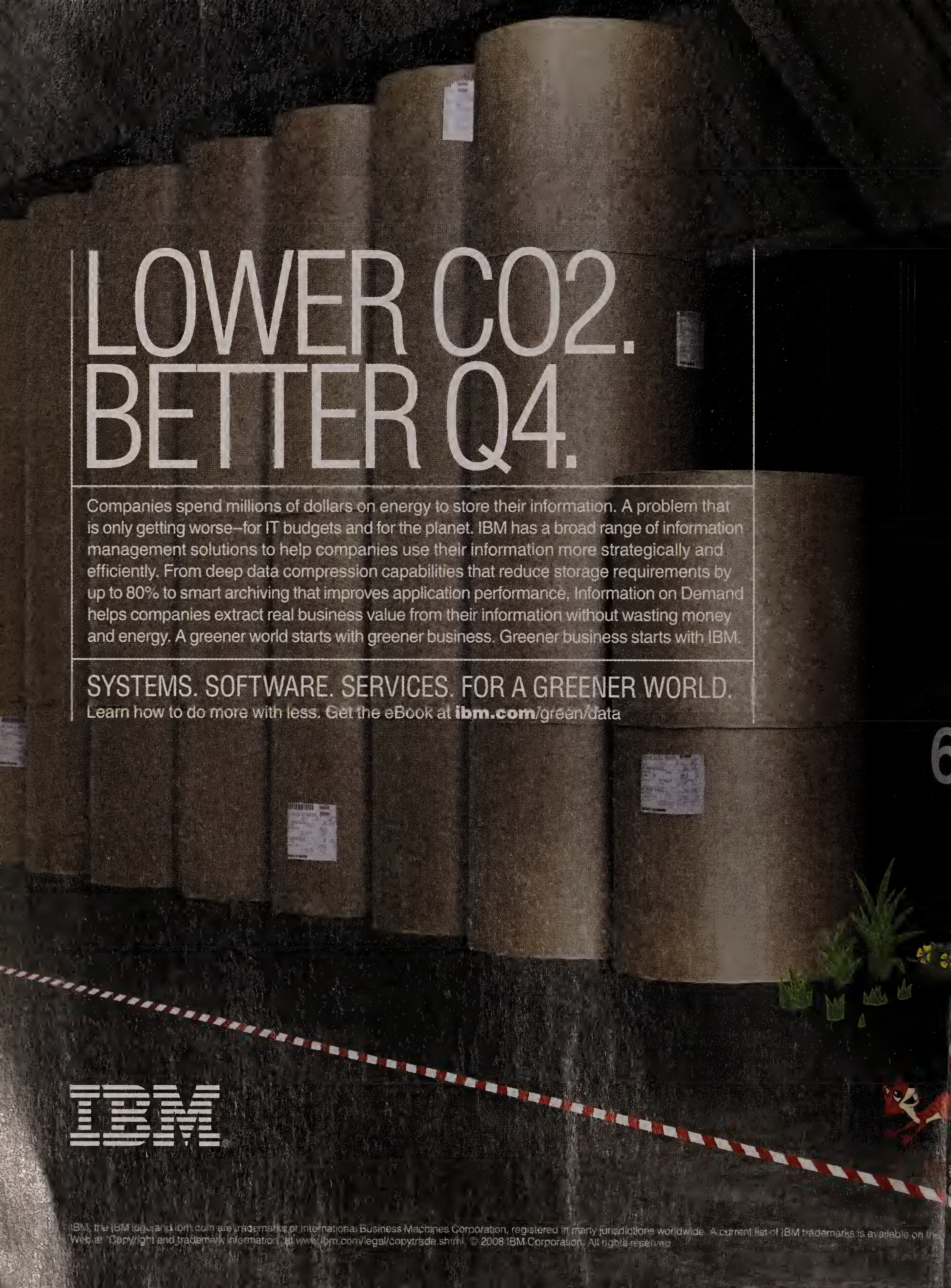
Moving functionality to the network layer and outside of the storage array yields the key benefit of common management of heterogeneous physical storage devices. Originally positioned as a means of commoditizing storage systems, the primary (but not sole) applications include data migration and replication. Clustered network-attached storage grids, a form of outside-the-box virtualization, also provide uniform capacity and performance scalability.

Tape emulation. As represented by virtual tape libraries, tape emulation is probably the nearest thing that the storage world has to a "pure" virtualization product category; it involves abstracting disk storage to appear as tape storage. Backup is a perennial problem for most organizations, and introducing disk to the backup process in the form of a VTL is a relatively easy way to address many of the performance and management issues associated with tape backup.

As with any generalization, there are bound to be exceptions. One example is Hitachi Data Systems' Universal Storage Platform family, where outside-the-box features are found within the array controller rather than at the network layer.

The movement to virtualized storage is inevitable. Unfortunately, the options can be confusing. Rather than focusing on virtualization per se, understand and prioritize requirements and the functions needed to meet them. ■

James Damoulakis *is chief technology officer at GlassHouse Technologies Inc., an IT infrastructure consulting and services firm.*



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Career Watch

ASK A PREMIER 100 IT LEADER

Anthony Hill

The CIO at **Golden Gate University** in San Francisco answers questions related to the challenges of a new boss and pursuing a graduate degree.

When my boss retired earlier this year, someone from the outside was brought in. She operates very differently. Where my old boss liked to pick the staff's brains and foster discussion, our new manager gets ideas of her own and isn't interested in any input from us. Many of us feel we're heading in the wrong direction with some of her initiatives, but we don't get a lot from her about why she's doing what she's doing. What can we do? Understanding what others want and need is one of the hardest challenges in management, and in being managed. Often, the experience you are describing stems from basic personality differences or a lack of awareness of what others are perceiving. It may be that your old boss was an extrovert and thrived on discussion and collaboration, while your new boss is an introvert and is more comfortable working with ideas. Often, the latter can be perceived as not wanting input or as preferring to generate their own ideas, but the reality is they just are not as comfortable asking for input or proactively communicating. Remember, she is new in the job, does not know the team well, is trying to prove herself, and would likely benefit from you and the team taking the first steps to reach out and collaborate. It may take multiple tries.

All good managers and leaders know how to get input from their team and channel that input into action. I suggest giving her the benefit of the doubt and helping her with collaboration – something that is a challenge for her. If that fails, then she operates at her own peril, because a manager is only as good as her team, and she needs you in order to be successful.

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QUESTION?
If you have a question for one of our Premier 100 IT Leaders, send it to **askaleader@computerworld.com,** and watch for this column each month.

I'm paying my way through graduate school by holding down my full-time job doing networking for a big company. I'm doing my job as well as ever, but I sense some resentment. I guess I just want someone to tell me what that's all about. Congratulations on your motivation and work ethic. I have managed people pursuing graduate degrees while working full time, and I've done that myself, so I know that you have to manage your energy level and make sure you are still contributing the same amount of creative energy at work as you did before your graduate studies.

There is a difference between "doing the job" and contributing creative energy that goes beyond basic job requirements. It may be that your co-workers or managers are picking up on an energy change with you and sense you have begun to reallocate your energy away from the job. You may not even be aware of this potential change in yourself because you are so busy trying to manage all your time demands, and the signs are subtle. They could also have picked up a sense from you that when you get your degree, you will begin looking for a new job.

Earning a graduate degree says a lot about your character and is excellent for your career advancement, but it can breed resentment in those who believe you're preparing to make an exit. Ultimately, they only know what you telegraph or say about yourself. Carefully manage those perceptions, and perhaps obtaining your advanced degree will result in a promotion at your current employer. They would be crazy not to want people like you. ■

The Reporting Report

One-third of CIOs or the most-senior IT decision-makers report to the CEO, according to Forrester Research Inc. The overall rate of 34% rises to 46% for those in business services, and drops to 24% for those in the public sector (where CEOs are hard to find) and for those in the media, entertainment and leisure industries (in which the most common reporting relationship is CIO to CFO). Company size is also a factor.

Does the CIO or most-senior IT decision-maker in your company report to the CEO?

Fewer than 1,000 employees	21%
1,000 to 4,999 employees	35%
5,000 to 19,999 employees	32%
20,000 or more employees	38%

Base: 503 IT decision-makers

SOURCE: FORRESTER RESEARCH INC., JULY 2008

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TRUE TALES OF IT LIFE AS TOLD TO SHARKY

Urgent, Redefined

Pilot fish has the on-call pager for the weekend, but he wants to spend some time with a friend who is having some problems, so he arranges for a co-worker to cover for him. "Pager goes off at 6 a.m. Saturday," groans fish. "While I'm at this friend's place. Three hours' drive from the office. Having had a lot to drink on Friday night." But fish answers the page from his boss, who wants him there right away to supervise a vendor engineer who's coming to fix an urgent problem. Nobody else can make it in time, boss tells fish, including the person covering for fish. One long but very careful motorcycle ride later, fish gets to the office. No vendor tech. At 11 a.m., fish's boss shows up. No tech. At 2 p.m., the co-worker who's covering for fish shows up. No tech. At 3 p.m., fish goes home – and there's still no tech. "Found out Monday that the tech didn't get there until 6 p.m.," fish says. "The emergency? The vendor had delayed a routine maintenance call until the weekend and asked if someone could be there – something that could easily have been rescheduled for the following week if someone, namely me, had objected. I deserved that hangover."

Wetware Problem

HR staffer complains to support pilot fish that her voice mail isn't working properly. "She had me listen to her voice mail, which does have several messages in a row where I hear nothing before the click of the calling party hanging up," says fish. "She wants to know why the voice-mail system isn't recording messages." Fish says he thinks the system is fine – the calling party just isn't saying anything before he hangs up. She insists that can't be it, because it's happening so often. But fish knows the voice-mail system has a feature that announces the number of the caller if the right key is pressed during playback. "We found out all the blank messages came from the same number, a job applicant she had turned down for a position," fish says. "She praised me for being so smart and figuring out her voice-mail problem. I guess the guy didn't want to take no for an answer and wanted to talk to her live."

He Was Busy, OK?

Hurricane Ike's storm surge hits this Gulf Coast chemical plant and inundates it, reports a pilot fish working there. "The total number of desktop computers was earmarked to be written off," fish says. "But laptop computers were put on a list, to verify that the users had evacuated with their laptops. The only laptop that was reported lost belonged to the disaster recovery manager – who left it in his office."

■ *Sharky wouldn't mind being flooded with true tales of IT life. Send me yours at sharky@computerworld.com. You'll score a sharp Shark shirt if I use it.*

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FRANKLY SPEAKING

Frank Hayes

Target: You

HEARD ABOUT a competitor's security being breached? Then you're probably next. In fact, you may already be owned.

That's the logical conclusion to draw from a new report from Verizon's security services group (you can download it at *www.verizonbusiness.com/resources/security/databreachsuppwp.pdf*). It's a follow-up to Verizon's big report in June that sifted through data from more than 500 cases the company was hired to investigate over four years.

This time, Verizon sliced and diced the data for the four biggest industry groups: financial services, technology services, retailers and restaurant chains. That alone makes it useful to IT security people.

For example, in financial and tech services, almost 40% of breaches came from the inside, much more than in other groups. Retailers and restaurant chains took months to discover a breach, compared with weeks for tech firms and days for financial companies. And attack techniques varied with each industry: Deceit was big for financial firms, while hacking was huge for retailers and restaurants.

But a few things they all shared: By far, the favorite loot was credit and debit card data. And it was usually a third party, not someone inside the breached company, that discovered the break-in.

All this is worrisome enough. But when I talked to Bryan Sartin, who directs Verizon's investigative response operation and co-authored the new report, he told me something more troubling.

It turns out that attacks — especially those by organized gangs — come in waves. For example, starting around 2001, attackers focused on security holes in retailers' and restaurants' payment gateways. Often, they would target a specific company, then try different attacks until one worked — everything from network hacks to Wi-Fi war driving and even physical trespassing.

If you're using the same software as a competitor who's been hit, chances are good that you're a target too.

Then, in 2003, the style shifted. There were lots of network-based automated attacks — scanning and SQL injections — often from compromised servers overseas.

Today, Sartin told me, there's a new pattern: Crooks are targeting companies that use the same software — say, a particular point-of-sale system. They find a security hole, then track down other businesses that use the same POS system. (That's often as easy as checking the vendor's Web site for reference customers.)

Then crooks can compromise lots of targets in the same industry at once, using exactly the same attack.

See where this leads? If you're using the same software as a competitor who's been hit, chances are good that you're a target too. If an attack worked against him, it probably will work against you.

And if it happens to a competitor of one of your trusted partners, you're in the same situation.

And because it can take months for a breach to be found (usually by an outsider, remember), it's likely that by the time you've heard about that breach, you've already been attacked.

Of course, you probably don't know exactly what software your competitors use. So if you hear about *any* attack on a competitor, don't waste time gloating. Hit your own logs fast, looking for any unusual activity that could indicate a breach.

And if you haven't heard about a breach among your competition yet, don't relax — especially if you're in a credit-card-heavy business like retail. Keep scanning logs and watching for signs of a breach. Remember, you *are* a target.

Don't be the last to find out you're a victim. ■

Frank Hayes *is Computerworld's senior news columnist. Contact him at frank_hayes@computerworld.com.*

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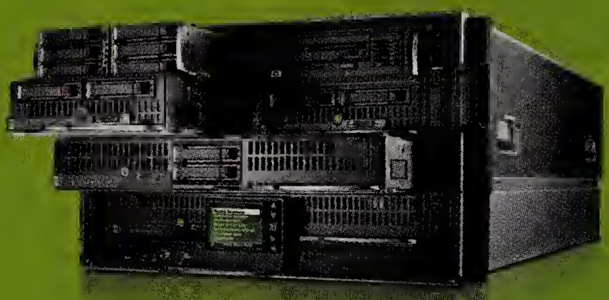

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